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LAST STONE IN BUFFALO BREAKWATER.

The Buffalo breakwater was completed on Sept. 24, thus bringing to a successful termination one of the most important harbor improvements which the government has undertaken. The technical features of the construction of this great work were thoroughly described in the Review of June 26, 1902. Of the 12,800 ft. of new breakwater at Buffalo 7,260 ft. are of stone and gravel and the remainder of timber and stone. After the breakwater was practically completed a fair portion of it was destroyed by a hurricane in the fall of 1900. The waves dashing against the vertical walls of the structure rose to a great height

The completion of the structure is a great achievement for Col. Thomas W. Symons, the government engineer who designed and supervised its construction.

STEEL CORPORATION'S PROFIT-SHARING PLAN.

The continued fall in the market value of the securities of the United States Steel Corporation has called forth a circular from the management of the combine which is designed to allay the fears of the employees who purchased the preferred stock on a basis of \$82.50 a share under the profit-sharing plan announced at the close of last year. The corporation in the circular agrees



Putting the last stone on the great Buffalo breakwater. Among those in the picture are Maj. Theodore Bingham, government engineer; Patrick O'Brien, superintendent for Hughes Bros. & Bangs, who laid the first and last stone in the breakwater; and Emil Low, assistant government engineer.

above it, variously estimated at from 75 to 125 ft., enveloping the breakwater in an immense sheet of water, which in falling struck the top of the superstructure with such force as to crush it in, the large timbers of which it was constructed being broken like pipe stems. The direction of the breakwater being at right angles to the axis of the storm tended further to accentuate the destroying power of the waves. When it came to the question of reconstructing this superstructure it was decided that concrete masonry was the material best adapted to enter largely into its construction. The facility with which this material can be made and shaped into monolithic masses was a great point in its favor. When it was decided to replace the wrecked superstructure with one of concrete it was considered expedient to disregard the usual practice of presenting a vertical face to the sea, but instead to adopt a sloping face, with a view of reducing the impact of the waves and allowing the water to pass over the structure in a flowing mass without detriment to it.

The commercial aspect of this breakwater to Buffalo is very important. It has given to the city an artificial harbor of great security and its advantages have already been attested by the location there of one of the greatest steel plants in the world.

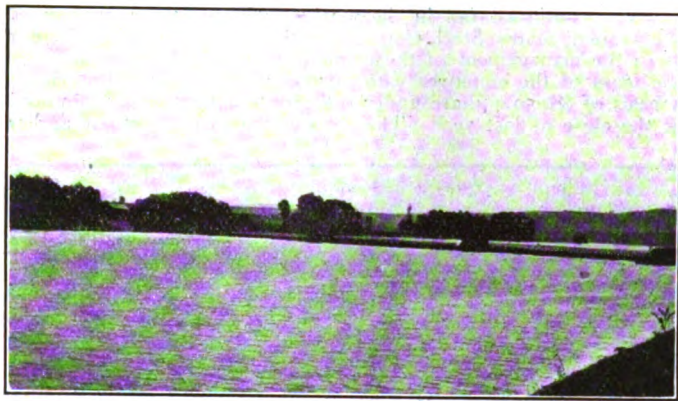
to buy back the stock in 1908 at \$82.50 per share, provided it is retained by the original holder for that length of time and provided he then desires to part with it. This was one of the points upon which Mr. Carnegie touched in his general commendation of the profit-sharing plan—that the wage earner should be safeguarded in his investment and his interest rendered immune from ordinary trade fluctuations. He said that it was only upon an absolute guarantee that the wage earner should be invited to participate in profits—such a guarantee, in fact, as a savings bank gives. This guarantee the corporation now gives. Under the profit-sharing plan 25,000 shares were sold to wage earners at \$82.50 per share. They were offered in addition to the ordinary dividend of 7 per cent. a bonus of \$5 per share per annum for five years, provided they retained the stock for that length of time and remained continuously with the company.

The battleship Missouri will soon be subjected to the preliminary machinery trials under control of the builders, and following a successful result the vessel will be completed for the official government trials over the regular course between Capes Ann and Porpoise.

TRAFFIC OF EUROPEAN RIVERS AND CANALS.

By Ray G. Floyd.*

London, Sept. 25.—We have examined the rivers and canals of France, Belgium, Holland, Germany and Austria-Hungary. Inland navigation in France is widely different from that in most of the other countries of Europe. Canals have been built and rivers canalized on a very large scale. In many of these rivers and canals there are very frequent locks, oftentimes averaging more than one lock per mile. This is made necessary by the uneven surface. Between St. Quentin and Cambrai, in the north-east of France, there are two immense canal tunnels, one of them over half a mile and the other $3\frac{1}{2}$ miles in length. These were built in the time of Napoleon I., being begun in 1802 and finished in 1810. The amount of work done was enormous. At one end of the longer tunnel there is a cut more than 100 ft. in depth,

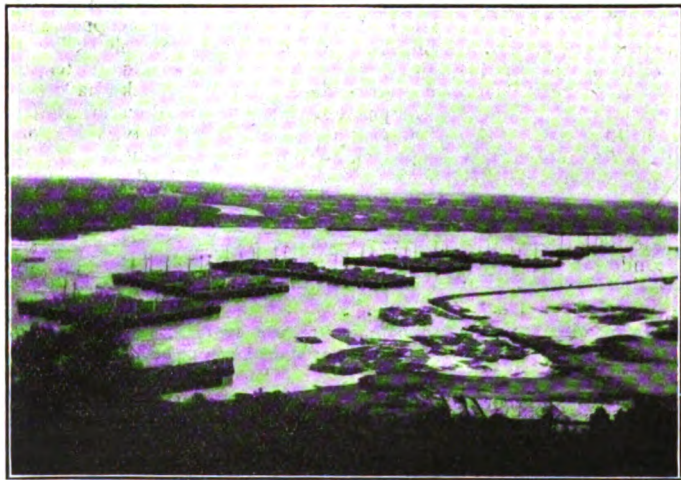


Dam in Seine River near Vernon, France.

which, with the methods of excavating in vogue at that time, must have required great manual labor. Over this stretch between St. Quentin and Cambrai there is a very large traffic in coal from Belgium and the northeast of France. A principal item of return freight on the route from St. Quentin to Cambrai is made up of timber used for the support of mines in Belgium. The total traffic over this section is something in excess of 5,000,000 tons per annum.

The canals and canalized rivers in the southerly and south-westerly parts of France are utilized in a much less degree. Even the Rhone river, with its great volume of water connecting important points, has a traffic of barely 300,000 tons per annum. Nevertheless, expensive improvements, both of canals and rivers, as well as of harbors, were decided upon at the last session of the French legislature.

The other countries named, as distinguished from France, have few locks in their rivers and many less in their canals. The water routes go over a more level country. For instance, on the Elbe river from well above Dresden to the mouth, 70 miles be-



Volga River Barges at Nevgorod, Russia.

low Hamburg, there are no locks. The current is swift in many places, but towage is provided by powerful steam tugs or by a stationary chain, which is taken up by a tug provided for that purpose, and wound around spools. This chain is taken up at the bow and, passing over the spools or cogs as described, is dropped astern. This same device has been used for a quarter of a century or more in France.

The Volga river in Russia, for a navigable course of nearly 2,000 miles, has no locks or dams. The headwaters are fed by two great reservoirs, in which the water is accumulated and from

*Mr. Floyd accompanied Congressman T. E. Burton, chairman of the committee on rivers and harbors of the house of representatives, in his tour of inspection of the waterways of Europe. The photographs illustrating this article were taken by him.

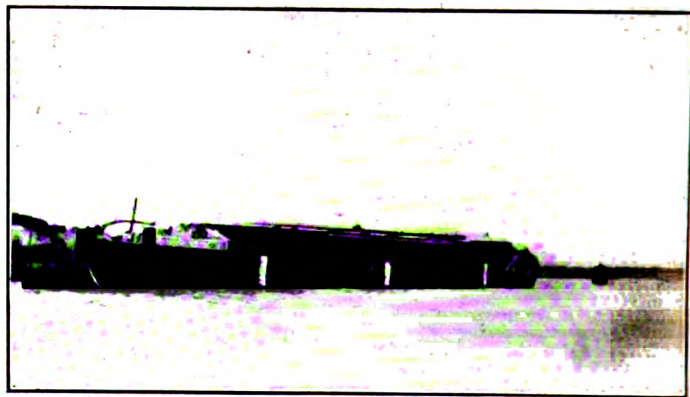
which it is discharged in seasons of low water. In the building of these reservoirs it is popularly believed that great walls and embankments are necessary, but such is not the case. They are merely great flat basins in which it is possible to accumulate



Steamer and Consort, Rhine River.

large quantities of water by comparatively small dams. The questions which arise are the quantity of land which can be overflowed and the abundance of the water flowing into the basins from tributary streams. Land is comparatively cheap and a large area was acquired for basins in the time of Peter the Great, about 200 years ago, who first devised the plan for these reservoirs.

The Volga is, in many respects, the most important navigable stream in Europe, as it is the largest in volume and in the area of the basin drained. The total length with tributaries, for vessels, is about 7,500 miles. Its upper waters are connected with the rivers of the Baltic basin by three canal routes—the Vishni-volotchok, leaving the Volga near the town of Tver by the river Tvertsa; the Tikhvinka route, leaving the Volga by the River Mologa, and the Maria route, leaving the Volga near Rybinsk by the River Sheksna. Each of these routes through rivers, lakes and canals reaches St. Petersburg by the Ladoga canal and Neva river, thus forming a through water route from the Caspian sea to the Baltic, and recently locks on the Maria canal have been



Elbe River Boat.

enlarged so that 600 to 800-ton barges can go from the Volga to St. Petersburg without breaking bulk.

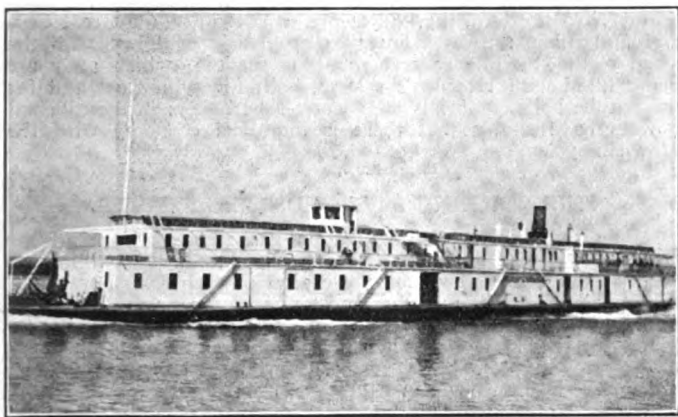
Unlike the Rhine and the Elbe, the Volga does not parallel competing railways. Mail steamers and a multitude of passenger boats ply on its waters, some of them making a speed of more than 18 miles an hour downstream and 15 upstream. There is one line of steamers the boats of which are named after American rivers, the Missouri, etc. They are intended to be built after the model of Ohio and Mississippi river boats, stern-wheel propellers, but these were found to be difficult to handle and most of them are now of the side-wheel type.

The Volga is like a great trunk line; railways cross it at right angles, and at each place of crossing great quantities of freight are transhipped from and to the interior. It is a notable fact that the great majority of the freight traffic is upstream. Naphtha residuum, as it is called, is the principal item. This is brought from the neighborhood of the Black and Caspian seas and is transported on the river in wooden tank barges, some of which are 420 ft. long and when fully loaded have a capacity of 4,000 tons with a draught of $12\frac{1}{2}$ ft. It is, however, only during spring high water, lasting about six weeks, that this full draught can be utilized. About 500 of these and smaller barges were moored in the Volga and its tributary, the Sheksna, at Rybinsk. Coal is very high in cost, especially in the northern part of Russia, and railway locomotives, steamers and industrial establishments are now using this naphtha as fuel almost exclusively, great storage tanks and depots being located at all the principal cities along the river. Some of these tanks are in the form of covered reservoirs built in the ground and slightly elevated. One of these res-

ervoirs at Rybinsk has a capacity of 40,000 tons and the total storage capacity at that point is said to be about 480,000 tons.

The season of navigation lasts about six months, and one of the disadvantages in the utilization of the Volga is that the wheat and rye crops (the latter of which is more than twice as great as the former) are not harvested in time for shipment during the season in which they are grown, and as a result the railways take a large share of the grain. Flouring mills are located at many places on the Volga which grind the wheat and rye. Much of the flour is of an excellent quality. Dredging is the principal means utilized to maintain the navigability of the stream, and the channel is well marked by means of buoys. There are numerous lights along the shores to point out the general direction and a very great number in the stream to mark at night the limits of the channel. Signals hung on poles along the shore at frequent intervals indicate the depth of water over the shallowest places. These signals are changed as often as three times daily when necessary.

The Rhine is next in importance to the Volga and in many respects more important. It is navigable for a length of 350 miles or more and serves a population of 16,000,000—one-third of the total population of the empire. The provinces of the Rhine contain more than 100,000 industrial enterprises, which employ 1,500,000 workmen or 40 per cent. of the industrial population of Germany. The production of iron in this region includes 83 per cent. of the whole; of coal, 50 per cent.; of wine, 99 per cent.; of hops, 94 per cent.; of beer, 55 per cent., and about one-half of the chemical products, salt peter, milling and textile industries—silk, wool, cotton and flax. Boats are as much as 300 ft. long and 40 ft. beam, with a draught of 9 ft., and they carry 2,100 tons. The ports of Ruhrort, Duisburg and Hochfeld have together a traffic of more than 13,000,000 tons, while that of Mann-



Volga River Passenger and Packet Steamer.

heim, which is the terminus of deep water navigation, has 4,500,000 tons. A barge with convoy can carry from Rotterdam or Antwerp to Mannheim 4,500 tons in nine to ten days.

The traffic of the Elbe, while inferior to that of the Rhine, amounts to one-quarter of the total river traffic of Germany. There is a traffic of 5,500,000 tons at Hamburg and about 2,000,000 tons at Magdeburg, and beside the Elbe has communication by the Havel and canals with Berlin as well as by the Moldau and canals with the Danube. The depth of the Elbe being inferior to that of the Rhine, boats are smaller, although they are 200 ft. long, 26 ft. beam and carry as much as 1,100 tons. Like the Rhine, the Elbe flows in the vicinity of inexhaustible deposits of coal, and a favorable circumstance is that great commercial and industrial cities like Berlin, Dresden, Magdeburg and Hamburg are either located upon the river or connected with it by waterways.

The Danube river has a very large traffic, though less than that of the Rhine and the Elbe. In making this statement it should be understood that the reference is to river traffic proper. The lower Danube up to Galatz and Braila has been deepened to 21 ft., and sea-going ships ply to these points. In distinction from the other rivers, the variation between high and low water on the Danube is not so great. The Volga during April and part of May is, in many places, as much as 15 miles in width, and even more. One of the great advantages possessed by the Rhine, the Danube and the Elbe is that their sources are in mountainous regions and the melting of the snow makes the supply of water in them more nearly uniform throughout the year.

As a general fact it may be stated that the prospect for the utilization of inland waterways for the carriage of freight was never more promising than now, at least on the continent of Europe. In Great Britain canals are, many of them, controlled by railways. Nevertheless the canals and rivers of England carry more than 40,000,000 tons of freight every year.

It is reported from abroad that the Allan line has ordered at Belfast a 12,000-ton turbine steamer for its Canadian service. This, if true, is a radical move considering the extreme caution with which the Cunard line is investigating the subject of turbines.

MR. BURTON RETURNS FROM EUROPE.

Hon. T. E. Burton of Cleveland, chairman of the committee on rivers and harbors of the house of representatives, has just returned from his extended inspection of waterways of Europe. He will go to Washington before he returns home, but he has given out an interview in New York city concerning his observations. His interview is general and not specific; and it is not known whether he intends to recommend any changes in the method of taxation for waterway improvements. That part of the interview that refers specifically to rivers and harbors is as follows:

"The relation between railways and waterways in providing transportation in Europe is not quite the same as in the United States. The railways in the majority of countries are owned by the states or governments. The canal or river is used in a larger degree, partly because of the existence of a very numerous class made up of those who for generations have been boatmen. Children are born and families live and die on the canal boat in France. Then, too, as railways are now constructed, the carrying capacity is less in the countries of Europe than in our own, and usually the proportion between the weight of load carried and the weight of the car is unfavorable when compared with our own railways. After making due allowance for all those difficulties, it should be noted that the disposition to improve inland waterways was apparently never stronger in Europe than it is today.

"I am very glad to have taken the trip; it has been a most instructive season, perhaps the best schooling I have ever had. We have been constantly active, and as regards suggestions for improving rivers and harbors in the United States, we have found something which illustrates almost every project under consideration. For example, there are several towns in this country somewhat remote from the sea in which there is a strong agitation for deepening channels and giving to these interior localities the position of a seaport. There are numerous illustrations of this situation in Europe. There are rivers with railways on one or both banks where there is strong competition for the carrying of freight, and where the problem of what class of freight should be carried by water and what by rail would naturally be solved. There are canals and rivers which can only be improved by the construction of numerous locks and dams. In France there are frequent tunnels on canals, one of which is three and a half miles long. There are other countries where the bed of the river is so level that no locks or dams are necessary. There are rivers, like the Volga, which are fifteen and twenty miles wide in the freshest season, and others, like the Danube, where the variation between high and low water is comparatively small.

"In regard to the policies of government, every idea is illustrated. In some cases cities like Hamburg and Bremen spend enormous sums for the improvement of their harbors and for the deepening and maintenance of channels to the sea. In other cases, as in Russia, all these expenses are paid by the general government. On the Danube and Theiss rivers in Hungary levees to protect adjacent property from overflow are constructed at the expense of the adjoining proprietors. On the other hand, in Austria on one of the same rivers, the Danube, these levees are constructed solely at the expense of the general government. There are cities like Constantinople which perhaps present the best illustration of a wasted commercial opportunity in the world, where a majority of passengers disembark in the midst of the channel and are carried in row boats or tenders to the shore. There are others where expensive docks have been constructed, to enable the passenger boats in all conditions of tide to moor beside substantial docks and near railway stations.

"As regards the improvements in our lake cities and the smaller cities of the seaboard, it should be noted that only a small fraction of expense has been incurred in comparison with improvements which have been made in several European cities. The total expense for improvements at Liverpool, which next to London is the most expensive port in Europe, has been \$130,000,000. Of course a large share of this is for warehouses and to construct basins in which boats can be located so as to be independent of the influence of the tide. It would be very difficult to compute the expense incurred in and below London for the improvement of the channel of the Thames, and the construction of wharves, docks, warehouses, and other forms of equipment for commerce, but undoubtedly the total amount would be a large share of our national debt."

Rear Admiral Charles W. Rae, engineer-in-chief of the navy, has designated the following board of engineer officers to accompany the battleship Maine to Culebra this month to investigate and report upon the workings of her boilers: Capt. John A. B. Smith, president; Lieut. Com'dr Frank H. Bailey and Lieut. Com'dr Wythe M. Parks. Rear Admiral Rae believes this board to be thoroughly competent and has spent considerable time in selecting the members. In order that every opportunity may be afforded the builders of the Niclausse boiler to demonstrate its value for marine purposes, the board of construction will probably approve the recommendation of Rear Admiral Rae that the builders of this boiler construct a boiler of the improved Niclausse type for test on land before the board finally settles the boiler question.

The Dominion Fish Co. is having another tow boat built at Marlton's yards, Goderich, Ont.

TURBINES FOR CUNARD SHIPS.

Disposition to Adopt them Prompts the British Government to join in an Inquiry into the whole Question—in the hands of a Commission of Experts—Glasgow Shipping Letter.

Glasgow, Sept. 26.—The admiralty, on the suggestion of Lord Inverclyde, has decided to join the Cunard Steamship Co. in instituting a commission of inquiry into the whole question of the steam turbine. The admiralty has nominated as their representative Admiral Oram, the deputy engineer-in-chief of the navy. The admiralty has also agreed to Lieut. Engineer Wood acting as secretary, in which capacity he has served on the boiler committee, and has done good work on trials, which experience will make him serviceable on this turbine commission. Mr. J. Bain, the general manager of the Cunard company, is also a member, and he knows all the requirements of the Cunard company's service from the engineering point of view. Mr. J. T. Milton, the engineering surveyor of Lloyd's Registry, will represent Lloyd's. Mr. H. Brock of Denny & Co., builders of the present turbine-propelled merchant boats, will be a practical member. Mr. Andrew Laing of the Wallsend Engineering Works and Mr. T. Bell, the engineering manager at the Clydebank works of John Brown & Co., complete the list, which is a very representative one, and includes men of wide experience. The commission will conduct a number of trials with the view of settling at rest the question of the steam consumption, or fuel economy, of the steam turbine fitted to merchant ships. The results of the special admiralty trials of the torpedo boat destroyer *Veloxy*, which has Parsons' steam turbines, will be placed at the disposal of the commission. and special trials will be made in one of the vessels recently built with turbines—the *Queen Alexandra* or *King Edward*. The Cunard company is anxious to take no step which will involve any doubt as to the absolute efficiency of the new ships to meet the most severe war or peace conditions, and to ensure that the vessels embody all that experience, patient research, and sound judgment can suggest, and represent the highest attainment in marine construction according to present conceptions. The work of design of the new Cunarders will be delayed until the turbine commission makes its report.

ADVANTAGES OF THE TURBINE SYSTEM.

An experienced Clydeside engineer declares that the Cunard company is performing a duty to the nation in endeavoring to decide the dimensions of the proposed two fast steamers and the motor to be employed. In considering these points they have met the fact that to obtain the contract speed of 24½ knots per hour across the Atlantic in fair and foul weather, these boats must be capable of at least 26 knots an hour, with another knot to spare. These speeds require at least 75,000 brake horse power. With reciprocal engines, he says, it is practically impossible to use more than three lines of shafting, thereby involving the transmission of at least 25,000 brake horse power per shaft, whereas the greatest power hitherto transmitted on board ship has been under 19,000 per shaft. This would require shafts of over 31½ per cent. greater strength than the strongest now in use. If it is attempted to meet this by increasing the diameter of the shafts the friction will be rapidly raised, not only by the mere increase of surface and leverage against the engines, but by the weight, to say nothing of the difficulties of manufacturing these large shafts. If it is attempted to meet the case by the use of nickel steel, or by Stead's method of converting the metal largely into "sorbite," then will arise all the uncertainties of homogeneity of metal throughout the shaft, and the probabilities of shafts breaking in a heavy seaway through "racing" or contact with floating wreckage. Therefore, the shafting question alone puts the reciprocal engine out of court. He does not dwell on the enormous vibration which would be produced by 75,000 H. P. of reciprocating engines aboard ship, of their great cost, weight, space occupied, multiplicity of parts, large and expensive oil consumption, army of engineers and oilers, and their great coal consumption, which in the case of the *Deutschland* exceeds 1.45 lbs. per indicated horse power hour, or about 1-2-3 lbs. per brake horse power hour. Against these the turbine, he holds, presents the following advantages: Five shafts may readily be employed, thus reducing the power to be transmitted per shaft to 15,000 B. H. P. (against 25,000 B. H. P. for reciprocal engines) and the turbine shafts (owing to their increased number of revolutions per minute) may be of less diameter and weight per horse power transmitted, thus greatly reducing friction and leverage adverse to the turbine and rendering the making of the shafts comparatively easy. Turbines are of less cost and weight, occupy less space aboard ship, produce no vibration, and consequently neither annoy the passengers nor injure the hull of the ship, require no oil inside, thereby returning the condensed steam free of grease to the boilers, and require comparatively little attention from the engineers. Consequently many fewer men are needed on board. As their racing in a heavy seaway can be automatically prevented, they require almost no repairs, owing to their simplicity and strength of construction, and, what is of great importance, will drive the ships easily up to 30 knots across the Atlantic with under 1 lb. of coal per brake horse power hour. The saving of coal per round trip with turbines would be nearly (on 75,000 B. H. P.) 7,000 tons, and in time 45 hours (nearly two days). In other words, 75,000 B. H. P. of reciprocal engines will drive the ships across one way in 123 hours (taking the speed at 24½ knots and the distance at 3,013 knots) with about 6,864 tons of coal; whereas 75,000 B. H.

P. of turbines will accomplish the passage one way in 100½ hours at 30 knots speed with about 3,365 tons of coal.

INDICATIONS OF AMERICAN COMPETITION IN IRON.

There has been a perceptible easing down in pig iron since my last letter, on dearer money and weaker advices from your side, but no appreciable change in the position of steel, and, therefore, of ship building material. There are, however, reports that American agents are beginning to negotiate the sale of iron and steel in England, and also that British steel makers are preparing to combine both against undercutting among themselves and to counteract imports. These things tend to keep back owners who may be thinking of treating for new ships.

HOWDEN DRAFT SYSTEM ON 1,500 MERCHANT VESSELS.

As showing the change that has occurred in recent years in the system of draft applied in connection with marine boilers, it may be noted that according to Lloyd's latest list the installations of the Howden system on merchant ships now number 1,500, in addition to battleships, cruisers and yachts. Ten years ago the closed stokehold system was almost exclusively adopted where a high evaporation was desired; but nowadays Howden's system is most favored because the means employed to ensure adequate air supply direct to each furnace independent of atmospheric conditions combines the utilization of a large part of the waste heat in the uptake to the funnel, for heating the draft for improving combustion and economizing fuel. With broad-beam ships such controlled draft is necessary to get the required amount of air to the boilers in the wings, as ordinary down-cast shafts at the sides must not be allowed to obstruct promenades. Several of our fast channel steamers are being fitted with this system and the three fast night boats on the Queensborough and Flushing route are now in succession having the closed stokehold system removed in favor of the Howden arrangement. The new boats for the London & Northwestern, the Lancashire & Yorkshire, the Great Central and other railway companies are being equipped with the same method; while several warships for the British navy are being fitted with Howden's system, both for cylindrical and for water-tube boilers. Trials with water-tube boilers for continental powers have shown that there is improved economy with the Howden system.

SHIP BUILDING IN THE UNITED STATES.

The commissioner of navigation has received from all the ship yards of the country that are equipped for the building of steel vessels returns showing the capital of each firm, number of men employed and the number and tonnage of merchant ships and government vessels building on July 1, 1903. A comparison of these figures with corresponding statistics representing the conditions July 1, 1902, shows a very heavy decline in the construction of merchant ships which has not been entirely offset by the unusually large amount of government work in hand. The total number of steel merchant vessels under construction on July 1, 1903, was eighty-eight, having a gross tonnage of 255,675 tons, as compared with 104 vessels with a gross tonnage of 347,480 tons on July 1, 1902. The government vessels under construction on July 1, 1903, numbered forty-seven, with a gross tonnage of 334,147, as compared with sixty-seven vessels, with a gross tonnage of 269,890, on the same date of 1902. The total number of steel vessels of all kinds (merchant and war vessels) under construction on July 1 of the present year was, therefore, 135, with a gross tonnage of 589,822 tons, as compared with 171 vessels, with a gross tonnage of 617,376 tons, on the corresponding date of last year. Of course since these returns were compiled a great many of the vessels have been completed, and it is significant that very few new orders are forthcoming.

Another statistical report from the bureau of navigation deals with the number of merchant vessels built during the three months ended Sept. 30. In this quarter the ship yards turned out 310 sail and steam vessels of 66,023 gross tons, compared with 348 vessels of 103,421 tons during the corresponding quarter of last year. The ship building of the past three months was divided as follows as to districts:

	WOOD.				STEEL.				TOTAL.	
	SAIL.		STEAM.		SAIL.		STEAM.			
	No.	Gross tons.	No.	Gross tons.	No.	Gross tons.	No.	Gross tons.	No.	Gross tons.
Atlantic and Gulf	87	10,422	82	4,631	1	3,248	8	2,208	178	20,509
Porto Rico	1	7							1	7
Pacific	9	1,972	34	5,095			1	484	44	7,551
Hawaii										
Great Lakes	3	36	28	649			14	33,917	45	34,602
Western Rivers.			42	3,354					42	3,354
Total	100	12,437	186	13,729	1	3,248	23	36,609	310	66,023

In the month of September the number of new vessels was eighty-seven and the tonnage 13,579. The largest was the lake freight steamer *Robert L. Ireland* (4,470 tons), built at Chicago.

H. A. Dean, purchasing agent of the Staples Coal Co. of Taunton, Mass., has bought the ship yard owned for many years at Bath by William Rogers. It is said the purchase price was \$12,000. Mr. Rogers, during his career as a ship builder, launched 103 wooden vessels. It is understood to be the purpose of Mr. Dean and his associates to increase the facilities of the yard.

PHILADELPHIA SHIP-BUILDING NEWS.

Philadelphia, Oct. 7.—The anticipated reorganization of the William Cramp & Sons Ship & Engine Building Co. and the retirement of Charles H. Cramp from the presidency took place on Friday last at a meeting of the board of directors in the company's offices in the Bourse building. Henry S. Grove was elected to succeed Mr. Chas. H. Cramp. Edwin S. Cramp was re-elected vice-president and R. W. Davenport was chosen as a director and as general manager. The new president, Henry S. Grove, is a New Yorker and has been a member of the voting trust since its establishment. As he himself states he is not a practical ship builder but a financier. R. W. Davenport, the new director and general manager, has had large experience with the Bethlehem and Midvale steel companies and is a practical man in almost all that appertains to ship building. Referring to the future of the company, President Grove said:

"The new policy of the company will consist largely in a better co-ordination of all the forces at its command. In the quality and individual efficiency of these forces there is hardly anything wanting. But even a football team composed of the best players in the world would not amount to much if its team work were not up to individual work. Concentration and economy of effort and capital will be a prime principle of the new policy. In every old concern, the management of which has not changed for years, there must be material that has survived its greater usefulness. This is true, to some extent, of the corps of employees at the Cramp ship yard. Changes will be made—not necessarily dismissals, for a man whose efficiency in one place has fallen below par may often fill a different place in the same concern satisfactorily. There will be a reduction in the running expense—at least in the percentage of expense to the value of the product. But there will be no sudden, rash or sweeping action of this sort. It is not proposed to make any large additions to the plant for the present. The Cramp yard is sufficiently equipped, as is proven by the splendid work that it has done. The great thing is to get the best results possible from that equipment."

In tendering his resignation Mr. Cramp presented the following communication:

"A desire for relief from some of the exacting and oft-times onerous duties of chief executive of this corporation, with its vast and complex business, and a desire to create conditions more favorable for my personal comfort, impel me to hereby tender my resignation as president. I need not assure you that my interests and efforts for the welfare of the corporation will not be terminated by this action." The following resolutions were then adopted:

"Resolved, that the board of directors has learned with profound regret of the intention of Charles H. Cramp to resign as president of this company, and out of deference to his expressed desire we hereby accept his resignation.

"Resolved, that this board, being desirous of continuing for the benefit of themselves and the interest they represent of the active aid and valued co-operation of Charles H. Cramp in the management otherwise than as a director, do hereby create the office of chairman of the board and tender the same to him with the expression, the earnest wishes that he will at once signify his acceptance."

The New York directors of the company, in addition to Mr. Grove, are E. C. Converse, an officer of the United States Steel Corporation and president of the Liberty National Bank; F. L. Heine, vice-president of the First National bank of New York and prominent in the National Pump Co., and Albert Strauss, connected with the banking firm of the Seligmans. The opinion seems general locally that the reorganization means that the Cramps are great ship builders, but that the financial management of such a large corporation is a business by itself, quite separate from the management of the works, and that it is best to relieve the Cramps of the financial care. "Before long we expect to close some important mercantile marine contracts," was President Grove's final statement.

The agitation for a 35-ft. channel from this port to the sea goes earnestly on, and during the past week the project has been endorsed by additional commercial bodies. Capt. William G. Randle of the New York Ship Building Co. said anent the matter: "The movement for a 35-ft. channel is one that should not cease for a single hour until that object is achieved. There is a most pressing need for a channel of at least that depth if the shipping of this port is to be fostered, and in my opinion the people, through their representatives in congress, should make this fact known and unceasingly labor until the government does what it should in that direction. Then the commerce of the port will increase beyond all expectations." Going further Capt. Randle makes the point, and makes it strongly, that the deepening of the channel will directly lead to marine construction and the advancement of marine interests generally. He holds that the subject is of national importance; that shippers throughout the country will be benefitted by a deep-water channel in the Delaware. "We have in the river," he said, "a splendid waterway; an outlet to the sea for manufactured articles and raw products. Why, then, should the people not have every facility to ship their commerce with speed and safety?"

John B. Roach, the head of the large Chester ship building plant, said: "We are building and sending away vessels that will be unable to return if loaded. On the Delaware we build modern sea carriers too large for service in our own shallow waters.

Without a 35-ft. channel we are closing our eyes to our opportunities."

The boards of trade and other commercial bodies as well as marine interests of Chester and Wilmington are uniting with Philadelphia to secure a 35-ft. channel. Extensive improvements, including a 21-ft. channel in the Christiana, additional docks and wharves, etc., are also being planned for Wilmington, at an estimated cost of \$600,000.

At Trenton, N. J., last week the case of the Reading railroad to recover \$24,000, money paid to John H. Dialogue & Son of Camden, because of alleged defective work in building a tug was thrown out of the United States Court, the plaintiff failing to make a case. In the Camden Circuit Court Oct. 1 the Neafie & Levy Ship & Engine Building Co. secured a verdict for \$3,680.25 against Michael Herron for work done on three of defendant's tugboats.

Two large barges, each capable of carrying twenty passenger coaches, constructed at the New York Ship Building Co.'s works for the New York, New Haven & Hartford railroad, were completed last week and delivered to the owners at New York. The fire tug Abram S. Hewitt, built for the fire department of New York, will be formally turned over to that city this week.

The cruiser Minneapolis went into commission Monday as a training ship for engineers at the League Island navy yard. Capt. Adolph Marix, who has been captain of the navy yard for years, commands the Minneapolis, which will also be the flag ship of Rear-Admiral Wise. Besides officers the vessel carries a crew of 450 men, including ship's crew and a marine guard of fifty.

Contracts for the construction of the large steel plant of the Delaware River Steel Casting Co., recently organized at Chester, have been let to the McClintock Marshall Construction Co. W. S. Logan of this city is vice-president of the new steel company. Actual work of construction began two weeks ago and is being vigorously prosecuted.

The Pusey & Jones Co., Wilmington, is putting extensive repairs on or practically partially rebuilding the following vessels: Barge Alice of the Bush Line; steel tug Dewey; tug Neptune of the United States engineering department; dredge New-castle and lighthouse tender Zizania.

Frederick Baldt, Sr., has resigned as manager of the Penn Steel Casting Works, Chester, and will hereafter be allied with the Baldt Steel Co. of New Castle, Del.

A complete overhauling is being given the large fishing steamer Alaska at the Harlan & Hollingsworth yards, Wilmington.

WORLD'S WASTAGE OF VESSELS.

The annual returns compiled by Lloyd's register showing the wastage of the world's merchant marine on account of wrecks, casualties and breaking-up show that during the year 1902 the total losses comprised 709 vessels of 559,884 tons. This does not include the breaking up of old ships not known to be consequent upon stress of weather or accident, and the condemnation of these vessels involved a further loss of 163 vessels of 140,806 tons. Of the vessels lost at sea 361 ships of 283,760 tons were wrecked; seventy-seven vessels of 55,744 tons were lost through collision and sixty-one of 47,088 tons were reported as missing. The minor causes of loss were foundering, burnings and vessels broken up or condemned. The summary makes it clear that steamers have a much greater immunity from disaster than have sailing vessels. The losses of steamers belonging to the chief maritime countries of Europe and to the United States of America amount to only 1.31 per cent. of the number and 1.14 per cent. of the tonnage owned, while the losses of sailing vessels reach 4.18 per cent. of the number and 3.98 per cent. of the tonnage.

The comparison which is supplied of the proportionate losses sustained by the various countries is of much interest, since it may be taken to some extent as an indication of the seaworthiness of the vessels sent out by them. In regard to this point the report says: "Great as the absolute annual loss of vessels belonging to the United Kingdom appears to be, it forms a very moderate percentage of the mercantile marine of the country and compares favorably with the losses sustained by other leading maritime countries. The merchant navies which exceed a total of 1,000,000 tons are those of the United Kingdom, the British colonies, the United States of America, France, Germany, Italy and Norway. Of these countries the United Kingdom shows the smallest percentage of loss, viz., 1.46 per cent. of the vessels owned. Germany follows with 2.25 per cent. and Norway is the highest with 4.58 per cent. As regards steamers, while the percentage for the United Kingdom stands at 1.11, the average of the percentages of loss for the other countries is 1.48. For sailing vessels the percentage of loss for the United Kingdom is 2.97 and 4.64 for the other six countries. These percentages exclude all cases of breaking up, condemnation, etc., not known to be consequent upon casualty or stress of weather."

Although the Detroit Steel & Iron Co., a Hanna concern, has met with a great many delays in completing its new blast furnace plant at Zug island, near Detroit, the work is now nearing an end, and a couple of cargoes of iron ore have been unloaded at the furnace dock, which is to have rapid unloading machinery. It is said that 100,000 tons of ore for winter operation of the furnace will be taken onto dock before the close of navigation.



A FINE SHIP YARD.

In the new plant of the Great Lakes Engineering Works, on the Detroit river just below the city of Detroit, where the first keel, that of a large steel steam freighter, is to be laid within a couple of weeks, the shipping interests of this section of the country have a ship yard of which they may justly feel proud. There are no frills to it, no elaborate waste on dreams of the future—simply evidence in all its parts that the men who built it had first in mind the thought of arranging buildings, tools, berths and slips so as to insure low costs in handling material; then they set out to profit by the best experience in this regard they could find throughout the country, and they were in position to take full advantage of this experience, as their work was from the ground up, in all respects a new plant. Looking at these works from this latter point of view, it is no discredit to the other ship yards of the lakes, most of them built up piece-meal through a long period of years, to say that none of them are to be classed with the new Detroit-river establishment. If there are ships to build on the lakes in the next few years, and there certainly will be many of them as in the past, notwithstanding the present fear of dullness, such a yard as that which the Great Lakes Engineering Works is now opening up, with all its advantages from a cost standpoint and with the practical and business-like methods that have been pursued in organizing it, should have a fair share of the orders.

Such are the impressions I gained after being afforded an opportunity, when in Detroit a few days ago, to make a hurried examination of the new ship yard. I was told by some of the principals of the company that they are not anxious to make a stir about what they are doing until they are fully under way and was in fact requested not to at this time enter into an extended description of the buildings or their equipment. It may be said briefly, however, that with an expenditure thus far of not quite a million dollars, this including the purchase of the old Hodge works, which is a valuable machinery plant operating at good profit, the company is about to put down a keel in a ship yard that is expected to handle 180 tons of material a day; and with probably less than half a million more, completing the expenditure originally planned, the ship yard will be entirely finished and a steel floating dry dock of 500 ft. length, 100 ft. width and 5,000 tons capacity built at the works as an adjunct from the important standpoint of ship repairs. In view of 30 ft. depth in one of the two 800-ft. slips on which there will be berths for three new vessels, the floating dry dock, carrying any size ship needing repairs, may be taken up to the very door of machine shop or plate and angle sheds,* within easy reach of all the tools and the entire overhead crane system that is used with such great advantage in new construction. The manner in which the traveling crane system, with independent pneumatic lifts at the large tools, covers all the handling of material, from the stock yards to the building berths and to the deep slip in which the floating dock may be operated, is the admirable feature of the works, especially when viewed in connection with the shop arrangement; and in the matter of tools it may truthfully be said that there are none better or larger in any ship yard of the country—all modern and put down on massive concrete foundation. Especially remarkable among the tools are large sets of plate planers and rolls. The rolls are 30 ft. long, the top roll 28 in. in diameter. A pipe threading tool in the building known as the pipe and sheet metal shop will handle pipe up to 12 in. diameter.

In the power house, which contains three boilers of 300 H. P. each with foundation for a fourth if it is required, provision has been made to store, if it is deemed advisable, thirty days' supply of coal (450 tons), and the handling of the coal, whether in full supply or not, will be at all times automatic. Coming into the yard in bottom-dump railway cars, the fuel, by means of a hopper arrangement just outside the power house, is carried by an endless chain of buckets to a large cylindrical steel storage receptacle above the boilers and fed to the furnaces by automatic stokers, the boilers thus requiring the attention of but one man. The ashes are also carried away from the furnaces by the same automatic device. As the works will be independent of the city of Detroit both as to water supply and fire protection, the power house includes apparatus for purifying water for the boilers and a complete fire system. But from a fire standpoint the company will very probably profit by a saving of insurance, as the buildings, well separated, are all of heavy steel frames with corrugated iron hawsings, excepting the commodious and well-arranged office building, which is of brick. Two engines of 225 H. P. each in the power house were built at the company's machine shop in Detroit where the greater part of the power house equipment was turned out. There are also three 375 K. W. generators and two vertical, two-stage, 3,000-ft. air compressors, these to supply

power for the numerous independent electric motors and pneumatic tools that will be used so generally throughout the works.

An attractive part of the plant is the spacious mold loft, the great unincumbered second story of a building 240 by 55 ft., on the ground floor of which are the joiner shop and storage department. In the joiner shop all the machines are driven by independent motors, and here, as is the case everywhere throughout the plant, even at the forge and in the bays where shapes and plates are handled, there is an abundance of daylight. Another building, not at all unimportant, will be devoted to the making of rivets and to ship yard tools, and in still another part of the property, far removed from the main buildings, is a paint shop.

All along the Detroit river frontage in the company's 85 acres of land there is a least depth of 22 ft. of water and in some places the depth is 42 ft.

J. M. M.

IRON ORE SHIPMENTS—LAKE FREIGHTS.

Shipments of iron ore to Oct. 1 of the present year are 19,376,493 gross tons, as against 20,708,000 tons to Oct. 1, 1902, or a decrease of 1,332,117 tons. The shipments during September fell off 710,441 tons in comparison with September of last year, being 2,946,639 tons, as against 3,657,080 tons for September, 1902. Here, therefore, is an adequate measure of what the total shipments are likely to be. They are not likely to exceed 25,000,000 tons, which would be allowing 2,801,753 tons for each of the months of October and November. With furnace stocks heavy, with Lake Erie docks crowded and with the ore movement so well in hand by contract vessels it would not appear as though there was so much in the ore trade for the wild carrier during the balance of the season. Rates are steady for the reason that there is nothing to be gained by cutting them. Inquiry shows that of the ore coming down the usual percentage is going directly to the furnaces. Sixty per cent. of the ore handled over Pennsylvania docks during September went directly into cars. Iron ore docks at all Lake Erie ports have been unusually free of vessels during the week, as the recent strike caused a bunching of Steel Corporation vessels at upper lake ports. On Saturday last only one vessel was unloaded at the three big docks of the Pennsylvania company at Cleveland, Ashtabula and Erie. The Steel Corporation vessels are competing in all trades and are taking coal and grain freely. Ordinarily the coal trade is confined to the smaller carrier, owing to its adaptability to all docks and prevailing stages of water, but of late many of the big 6,000-ton carriers have wriggled their way to coal docks that are unaccustomed to creatures of such bulk.

In their shipments for the season Duluth, Superior at Two Harbors are still ahead of last year, though September shows a falling off, which means that there has been a great shrinkage in shipments from Ashland, Marquette and Escanaba.

TWENTY MILLION MARK IN LAKE COAL SHIPMENTS.

It is probable that the movement of coal on the great lakes this season will come close to the twenty million mark. A report from the government bureau of statistics gives 13,323,755 net tons as the total to Aug. 30, the figures including coal taken aboard vessels for steaming purposes. Of this total 9,868,860 tons was soft coal and 3,454,895 tons hard coal. Out of 2,910,639 net tons of shipments to domestic and foreign ports in the month of August, 2,159,072 tons entered into coastwise trade and 751,567 tons into foreign trade. Of the August shipments 1,995,477 tons were soft coal and 915,162 tons hard coal.

A dispatch from Chicago is to the effect that lake travel out of that city is to receive material encouragement next year by the addition of a new passenger steamship line that will make the territory between Manistee and Ludington more accessible. By the passing of control of the Manistee, Ludington & Milwaukee Transportation Co. to the ownership of the Michigan Salt Transportation Co. the three passenger and freight steamers of the former line are made available and it is said that two other fast steamers are to be built during the coming winter. The new line will begin operations between Chicago, Milwaukee, Ludington and Manistee with the opening of navigation next year. It is the understanding that the two new boats will run from Chicago to Ludington and Manistee direct while two of the steamers just purchased will continue the route between Milwaukee and the east shore ports. The three boats taken over are the Pere Marquettes Nos. 2, 3 and 4.

Capt. Darieau of Simcoe island, Ont., has bought the Toledo schooner Metzner.

AMERICAN SHIP BUILDING CO.

From the annual meeting of the American Ship Building Co. (consolidated lake yards), held in Jersey City, N. J., Wednesday, comes the announcement that Mr. Robert L. Ireland, who has



R. L. Ireland, who joins the firm of M. A. Hanna & Co.

been active in the management of the combination since it was organized, has resigned the vice-presidency and will immediately take up membership in the well-known Cleveland firm of M. A. Hanna & Co. Mr. J. C. Wallace has been elected to that position in addition to the vice-presidency, taking his duties as general manager, and Robert Logan of Cleveland, well-known in lake ship building circles, is to be assistant manager. The matter of continuing the 1 per cent. quarterly dividend on the common stock was not taken up at the meeting and is still in the hands of the board of directors. The only change in the board is the election of Mr. Frank W. Hart of Cleveland to succeed W. T. Coleman Carpenter of New Jersey. Mr. Hart is a large stockholder in the Gilchrist Transportation Co. and also represents extensive ship building stock interests held by the Federal Trust Co. of Cleveland. The financial condition of the company is fully shown in the statements published herewith. For the purpose of comparison the condensed balance sheet of a year ago is published in connection with the one of date June 30, 1903, which was submitted at this meeting.

STATEMENT AS OF JUNE 30, 1903.

RESOURCES.			
Plants and property.....		\$ 15,188,711.82	
Additions and improvements for year		267,087.02	
Material on hand (market value)		848,764.22	
Work under construction (balance due us).....		3,335,559.99	
Accounts and bills receivable.....		2,935,417.99	
Cash.....		680,938.25	
		\$28,251,478.79	
LIABILITIES.			
Capital stock, preferred.....		\$ 7,900,000.00	
Capital stock, common.....		7,600,000.00	
Accounts and bills payable.....		3,772,462.65	
Reserve for maintenance		200,000.00	
Reserve for Buffalo mortgage.....		150,000.00	
Reserve for fire insurance.....		61,700.71	
Earnings.....		\$2,212,840.75	
Less dividend on preferred.....	\$553,000.00		
Less depreciation and maintenance.....	418,526.95		
Less rebuilding dry docks and other repairs	372,559.41	1,344,086.36	
Undivided profits for year ended June 30, 1903		\$ 868,754.39	
Surplus fund June 30, 1902	\$2,926,561.04		
Less dividends on common.....	228,000.00	2,698,561.04	
Undivided profits or surplus June 30, 1903		3,567,315.43	
		\$28,251,478.79	

STATEMENT AS OF JUNE 30, 1902.

RESOURCES.			
Plants and property.....		\$14,993,297.20	
Additions and improvements to plants during year.....		190,414.12	
Material on hand (market value)		640,559.54	
Work under construction (balance due us).....		1,076,728.02	
Accounts and bills receivable, and cash.....		3,258,887.90	
		\$20,159,886.78	
LIABILITIES.			
Capital stock, preferred.....		\$ 7,900,000.00	
Capital stock, common.....		7,600,000.00	
Accounts payable		888,325.74	
Bills payable (paid in July).....		500,000.00	
Reserve for maintenance		200,000.00	
Reserve for retirement Buffalo mortgage		150,000.00	
Earnings.....		\$2,507,551.07	
Less dividends paid, 7 per cent. on preferred.....	\$553,000.00		
Less depreciation and maintenance.....	420,293.55		
Less reserve for maintenance	200,000.00		
Less reserve for Buffalo mortgage.....	150,000.00	1,323,293.55	
Undivided profits for year ending June 30, 1902		\$1,184,257.52	
Undivided profits June 30, 1903.....		1,742,308.52	
Undivided profits or surplus June 30, 1902		2,926,561.04	
		\$20,159,886.78	

Officers and directors of the company are:

Officers—Wm. L. Brown, president; James C. Wallace, vice-president and general manager; Russell C. Wetmore, secretary and treasurer.

Executive committee—Luther Allen, William L. Brown, A. B. Wolvin, L. M. Bowers, Robert L. Ireland, Alexander McVittie, James C. Wallace.

Board of directors—Wm. L. Brown, H. H. Porter, Jr., of Chicago; Robert Wallace, H. M. Hanna, Robt. L. Ireland, James C. Wallace, J. C. Hanna, Luther Allen, Frank W. Hart of Cleveland; Alexander McVittie, W. C. McMillan of Detroit; J. A. McGean of New York; L. M. Bowers of Binghamton, N. Y.; A. B. Wolvin of Duluth; Andrew M. Joys of Milwaukee.

The president's report shows that during the year ended June 30, 1903, the company built at its several plants twenty-nine vessels of 166,000 net tons carrying capacity and had under construction on June 30, 1903, twenty-nine vessels of 165,000 net tons carrying capacity. In the previous year (ended June 30, 1902) the company built forty-one vessels of 198,500 tons carrying capacity and had under construction on June 30, 1902, thirty vessels of 139,000 tons carrying capacity. It will thus be noted that the output last year was very much larger than during the year just closed. On June 30 this year the amount of work under way was a little in excess of a year ago, but the prospects for new work are not now very encouraging. The following table deals with vessels built by the company during the year ended June 30 last and with work under construction on that date:

Plants.	Vessels built	Carrying capacity net tons.	Vessels under construction	Carrying capacity net tons.
Detroit	3	13,000	5	26,000
Lorain.....	7	47,000	6	45,000
Cleveland.....	7	40,000	3	11,500
Bay City.....	4	28,000	2	14,000
Chicago.....	1	21,000	5	24,500
West Superior.....	1	6,000	6	36,000
Buffalo.....	3	11,000	2	8,000

Referring to business prospects and to the condition of the different plants owned by the company, President Brown says:

"It will be noted that considerable construction was unfinished at the end of the fiscal year. Part of this has been delayed by the conditions that have surrounded all classes of manufacture during the year, and part was taken for later delivery. The future prospects of the company look very fair, and a number of negotiations for construction are pending. It is, however, not probable there will be as much of this as for several years past, as a presidential campaign always somewhat checks business. On the other hand, the prospect for the general business of the company is encouraging and no doubt will bring satisfactory results. Of late much attention is being called toward the construction of a larger type of vessel, and your president looks forward to a very considerable increase in this direction. It has been the aim and study of your officers to keep in close touch with all the progress and improvements in lake tonnage, and to contribute their part toward its encouragement. As outlined in the annual report of last year, material improvements and renewals have been made during the year at a number of plants, and especially so at West Superior, Detroit and Cleveland, in addition to which a number of dry docks have been rebuilt and lengthened, to keep pace with the larger lake tonnage. These expenditures have largely added to the value and efficiency of the plants. It will be noted from the treasurer's report that the sum of \$200,000 has been set aside this year for further improvements of this character when necessary."

Properties owned by the company are thus described: At Cleveland—Construction yard, machine shops, three dry docks, foundry and boiler shops. At Lorain—Construction yard, one dry dock, machine shop. At Detroit—Three dry docks, machine shops, boiler shops, foundry, brass works. At Wyandotte—Construction yard and machine shops. At West Superior—Construction yard, two dry docks, machine shop. At Milwaukee—Two dry docks, machine shop. At Chicago—Construction yard, one dry dock, machine shop. At Buffalo—Construction yard, four dry docks, machine shop. At West Bay City—Construction yard, machine shop.



James C. Wallace, now Vice President and General Manager.



Robert Logan, Assistant General Manager.

ONLY HALF A MILLION INCREASE.

General Movement of Freight on the Great Lakes would be less than last Year but for the Heavy Shipments of Coal to the Northwest—Sault Canal Figures.

A very heavy movement of coal to the northwest has certainly been the mainstay of lake commerce in the present season. This is proven by the Sault canal reports, the best index of lake commerce, which show to Oct. 1 a gain in the freight movement as a whole to and from Lake Superior of only 580,898 tons (2,000 lbs.), while the increase in coal shipments is 1,965,950 tons, of which 1,186,980 tons is soft coal and 778,970 tons hard coal. Added to the large shortage in iron ore, due in part to the strike of a week ago, is a decrease in Lake Superior business alone of 10,000,000 bu. of wheat, 1,380,000 barrels of flour and 1,125,000 ft. of lumber. The Lake Superior coal shipments to Oct. 1, 1903, included 4,642,588 tons of bituminous and 893,158 tons of anthracite, as against 3,455,608 tons of bituminous and 114,188 tons of anthracite on the same date in 1902. The increase in coal is, of course, largely due to the shortage that existed at this time a year ago. As showing the immediate effect of the recent strike of masters and pilots, it is noted that the Sault traffic for the month of September aggregated only 4,265,650 tons, compared with 5,403,808 tons in August, or a difference between the two months of 1,138,158 tons. Complete summaries of the traffic of both canals at the Sault, Canadian and United States, to Oct. 1 during three years past will be found in the following tables:

Movement of Principal Items of Freight to and from Lake Superior.

ITEMS.	To Oct. 1, 1903.	To Oct. 1, 1902.	To Oct. 1, 1901.
Coal, anthracite, net tons.	893,158	114,188	529,788
Coal, bituminous, net tons.	4,642,588	3,455,608	2,896,483
Iron ore, net tons.	17,745,150	18,536,170	13,583,867
Wheat, bushels.	30,421,255	40,444,267	23,663,694
Flour, barrels.	4,507,452	5,887,591	4,986,228

Report of Freight and Passenger Traffic to and from Lake Superior, from Opening of Navigation to Oct. 1 of Each Year for Three Years Past.

EAST BOUND.

ITEMS.	To Oct. 1, 1903.	To Oct. 1, 1902.	To Oct. 1, 1901.
Copper, net tons.	76,359	85,060	61,898
Grain, other than wheat, bushels.	13,790,255	6,616,911	9,859,324
Building stone, net tons.	9,640	30,392	32,709
Flour, barrels.	4,507,402	5,887,456	4,985,883
Iron Ore, net tons.	17,745,150	18,536,170	13,583,867
Iron, pig, net tons.	13,098	11,878	22,746
Lumber, M. ft. B. M.	713,107	884,216	771,577
Silver ore, net tons.		1	
Wheat, bushels.	30,421,255	40,444,267	23,663,694
Unclassified freight, net tons.	69,863	91,852	43,629
Passengers, number.	26,437	26,796	24,387

WEST BOUND.

Coal, anthracite, net tons.	893,158	114,188	529,788
Coal, bituminous, net tons.	4,642,588	3,455,608	2,896,483
Flour, barrels.	50	135	845
Grain, bushels.	1,290	19,627	56,480
Manufactured iron, net tons.	111,876	122,720	90,244
Salt, barrels.	300,668	326,339	347,017
Unclassified freight, net tons.	377,753	425,378	384,780
Passengers, number.	25,869	26,187	26,329

Summary of Total Freight Movement in Tons.

	To Oct. 1, 1903.	To Oct. 1, 1902.	To Oct. 1, 1901.
West bound freight of all kinds, net tons.	6,075,465	4,166,078	3,904,553
East bound freight of all kinds, net tons.	20,818,355	22,146,844	16,464,512
Total freight, net tons.	26,893,820	26,312,922	20,369,065

	Vessel passages.	Registered tons.
To Oct. 1, 1903.	14,554	21,652,286
To Oct. 1, 1902.	17,164	23,473,501
To Oct. 1, 1901.	14,561	17,706,056

CURTAILMENT OF MINING OPERATIONS.

Duluth, Minn., Oct. 7.—The curtailment of mining operations in the Lake Superior region continues, but on a moderate scale and at properties that either have large unshipped and undemanded stock piles, or that are making grades of ore at present unmerchable. The list of mines reduced in force or closed down entirely is about as follows: Vermillion range—Soudan closed, 500 men out. Mesabi range—Nothing as yet, though of course steam shovel mines will be idle as soon as navigation ceases and some others will be curtailed. Gogebic range—Ironwood group of the Oliver Iron Mining Co., 500 men out; Ashland mine, 250 men out; other producers, 200 men out. Marquette range—Negaunee groups all running full; Ishpeming group, Oliver Iron Mining Co., has closed its Section 21 mine, also its Volunteer and will shut down its Winthrop at the close of the shipping season, as it always does, but the close of shipping season from Winthrop is early this year. Those three properties employed nearly 500 men. The same company's Section 16 mine, Lake shafts, and others have been cut 190 men. The Cleveland-Cliffs Co. has cut its Ishpeming mines by 370 men, most of whom come out of the Cliffs and Lake mines. There will be a reduction in outlying portions of the Marquette range, though this is a small matter. On the Menominee range there

is to be a cut at Crystal Falls mines, excepting two or three, the cut approximating as nearly as can be ascertained 400 men. Several small properties and explorations that have been on the point of closing down for some time will now be closed, letting out perhaps 250 men. These are chiefly development propositions that have been more or less hopeful but have finally been passed upon (aside from any conditions other than those directly connected with their own appearance) as fruitless. The Michigan will close, letting out 60 men. There will be a small cut at the Chapin and possibly at the Pewabic; possibly also later at the Aragon. The number of men to be let out of these mines will be comparatively small, and cannot now be ascertained. The Iron River group will be materially reduced, possibly by 300 men, and the Cundy mine is closed, letting out 145 men.

LAKE CARGO RECORDS.

New cargo records on the lakes are probably at an end for the present season, as the stage of water in the rivers is not favorable to deep draught after the middle of the season. The steamer Wm. Edenborn's cargo of 8,807 gross or 9,864 net tons of ore stands at the top of the list. The steamer Cornell, also of the Steel Corporation fleet, took a large cargo of grain (241,453 bu. corn and 47,025 bu. oats) out of Chicago the other day, but it was not a record breaker. The number of tons in this cargo was 7,513, as against 7,532 tons of corn moved in a single load last season by the steamer Simon J. Murphy, and 7,520 bu. of oats and corn moved by the steamer Douglas Houghton. The records that will very probably stand for the present season are:

Iron ore—Steamer Wm. Edenborn, owned by Pittsburg Steamship Co., A. B. Wolvin of Duluth, manager, 8,807 gross or 9,864 net tons, Escanaba to South Chicago.

Grain—Steamer S. J. Murphy, Donora Mining Co., Duluth. 269,000 bu. of corn, equal to 7,532 net tons, South Chicago to Buffalo; steamer Douglas Houghton, Pittsburg Steamship Co., A. B. Wolvin of Duluth, manager, 308,000 bu. of oats and 60,000 bu. of corn, equal to 7,520 net tons, Manitowoc to Buffalo.

Coal—Steamer I. L. Ellwood, owned by Pittsburg Steamship Co., A. B. Wolvin of Duluth, manager, 7,688 net tons anthracite. Buffalo to Duluth; steamer John W. Gates, Pittsburg Steamship Co., A. B. Wolvin of Duluth, manager, 7,659 net tons of bituminous, Lorain to Duluth.

PROFITING BY DROP IN PRICE OF CEMENT.

Duluth, Oct. 7.—In June last the Duluth contracting firm of Hugo & Tims were awarded a contract for the construction of a concrete breakwater at Sand Beach, Mich., which is to be one of the largest pieces of concrete construction in the world. The breakwater is to be 8,000 ft. long, 38 ft. in width and 19 ft. deep. This will take an immense amount of cement. Such has been the drop in the price of cement since the work was let to this firm that there is now a profit of \$80,000 on account of the cement alone. It is not necessary that the contractors begin work on their concrete erection for another year, and there is no telling, of course, where the price of cement will go before that time, but it is expected that it will not advance much from present figures. This drop in the price of cement is largely due to the great increase in the number and output of cement works in the United States in the past year or so.

DULUTH FURNACE PROPOSITION.

Duluth, Oct. 7.—There has been some speculation since the decline in the iron market and the reduction in the price of pig iron as to whether the Zenith Furnace Co., operating a blast furnace at Duluth and erecting here large by-product coke ovens and a chemical plant, would be able to continue business without a loss on the present practice of selling its product in the east. W. L. Brown, A. B. Wolvin and other men prominently identified with the lake marine and with ore and steel are interested in this company. It is generally understood that the plans of the company do not contemplate selling pig iron in its raw state very long, but that works for putting it into a finished state are in contemplation. The present additions, in the way of coking plant, chemical works, docks, etc., will be running by Jan. 1 next, and at that time the company is under contract to sell the city of Duluth a portion of its surplus by-product gas for municipal use at 40 cents a thousand feet. Connections between the city mains and the furnace works are now under construction.

NAVAL TRAINING STATION FOR THE LAKES.

The board appointed a year or so ago, of which Rear Admiral H. C. Taylor was the senior member, for the purpose of examining and reporting upon a suitable site for a training station on the great lakes, has made its report to Secretary Moody. The board has carefully considered the many propositions submitted and suggests the selection of a site on the shore of the southern half of Lake Michigan, about 25 miles above the 42° of latitude. The board makes no further recommendations but leaves the selection of the actual location to be determined by congress. Secretary Moody will submit the report to congress and recommend an appropriation of \$250,000 for the establishment of the station. It is wise, indeed, that the board has concluded not to recommend the establishment of the station at any large city. A suburban location is the ideal one for a training station.

WORKMEN PAID AT SAULT STE. MARIE.

The time checks of the discharged workmen of the Consolidated Lake Superior Co. were cashed in full on Saturday last at the Imperial Bank of Canada. The Traders' Bank of Canada and the Canadian Bank of Commerce at the Canadian Sault, the government guaranteeing the refunding of the money. The banks were prepared to disburse nearly \$300,000. Mr. F. H. Clergue, who went to the Sault on Saturday, was cheered wildly by the men. Meanwhile Mr. John G. Carruth, the receiver, had taken steps to prevent the foreclosure of the mortgage held by Speyer & Co. and a definite plan of reorganization had been projected. Mr. Carruth issued the following statement to the stockholders on Thursday last:

"The sale of the property of the company pledged with Speyer & Co., of New York, for the loan of \$5,050,000 was to take place today, but upon urgent request has been postponed until Oct. 8 at 12 o'clock. It is necessary that \$250,000 should be immediately paid into the Equitable Trust Co. of Philadelphia, which will upon proper vouchers liquidate indebtedness of the Consolidated Lake Superior Co. as subsidiary companies. The payment of this sum will insure a further postponement of the sale for a period sufficient to enable the stockholders to accomplish reorganization if they act promptly and favorably by making this payment and providing for necessary expenses. It is imperative that the stockholders should pay on or before Oct. 6 to the Equitable Trust Co. an assessment of 50 cents a share. Every effort has been made to prevent the sale and the stockholders are now asked in their own interest to prevent the absolute and irretrievable loss of entire property. The amount paid will be upon the assumption of the adoption of the following plan of reorganization, which it is believed has been generally approved:

"To be raised by means of an underwriting open to all stockholders, \$8,000,000. This sum will repay the Speyer loan, the floating indebtedness of the company, all expenses of reorganization and leave about \$1,000,000 for working capital; the underwriters to reorganize a new corporation with \$40,000,000 capital, which corporation will take over all the property of the company under proper legal proceedings."

The talk that the United States Steel Corporation has been active in preventing a reorganization of the company is regarded as too absurd to contradict. The banks which advanced the money to pay the workmen under government guarantee now have a preferred claim upon the mineral and timber grants of the company.

The Engineering Record is discussing the affairs of the Consolidated Lake Superior Co. evidently from an engineer's source of information, says:

"The complete crash of a corporation with \$100,000,000 capital stock, which has spent a quarter of that amount in cash on its works and is today regarded so poorly that its assets can be bought for a small fraction of the amount actually invested, is a subject of more than ordinary importance. Although a great amount of discussion of this collapse is taking place in the papers, the true inwardness of the situation has not been made public, probably because the few men who know the actual facts are mostly engineers not given to talking about them except with intimate friends. No engineer could make a really careful study of the situation, not a study based on a superficial examination of a few days but one lasting weeks or months, without recognizing the inherent defects of the conditions that obtained during the last year. Much surprise has been expressed at the amount of money procured in the east for these enterprises of only moderate attraction to capital, but most of the sums were obtained in a perfectly natural manner, having little connection with the needs of the Consolidated Lake Superior Co. When the development started with the purchase of a water power plant by Mr. F. H. Clergue from the city of Sault Ste. Marie, Ont., and the construction of a ground-wood pulp mill, he financed the works in the east. As the enterprise extended so as to embrace a railway to bring down timber for the pulp mill, shops for making the machinery for this mill, and steel works for rolling rails for the railway, the original eastern investors went to friends indebted to them for important financial favors and enlisted their support in the projects. This process continued until it culminated last winter in an important banking house furnishing about \$5,500,000 on what was practically a blanket mortgage of the whole business. None of these people cared very much about the company or invested heavily, for them, in it; consequently they had no strong incentive to come to its rescue. They had gone into it moderately in return for past favors or in expectation of favors to come. The banking house went into the business beyond doubt simply as a matter of accommodation to gentlemen high in the official circles of a railway whose financial favors are very desirable. There are many small investors in the stock of the company and its subsidiary branches, but their total subscriptions are probably of little importance in comparison with those of a limited number of men who were in the enterprise out of friendship rather than any expectation of making fortunes from their investments.

"As for the works themselves, it is probably safe to say that nobody knows their value because they have never been properly managed and given an opportunity to show what they can do. Mr. Clergue is a remarkable promoter, but as a manager or a safe guide for investors he is a failure, as the past six months have fully demonstrated. This is shown clearly in the history of the Michigan Lake Superior Power Co. This is an enterprise for the development of about 50,000 H. P. by utilizing the rapids of the

St. Mary's river. The water power on the river front is owned by the Chandler-Dunbar Co., which has always been willing to sell out at a reasonable figure to the Clergue interests. Sooner than buy this, however, and build the power plant at the only place suited for it, Mr. Clergue constructed an enormous canal around the city and located his power house on a sand bank, which was partly washed out below it soon after operations started. Even assuming that there was any legitimate business reason for such a large power station at Sault Ste. Marie, Mich., which is considered questionable by conservative men long resident in that city, the plant itself, as a physical unity, is a source of amused wonder to those engineers who examine its general features.

"The metallurgical enterprises of the company, on which vast sums have been spent, are more difficult to appraise. The country north of Sault Ste. Marie is full of minerals, but very few mines there have ever been profitable. One of the company's gold properties is believed to be very valuable, and its operations have been kept a close secret. The nickel properties are known to be valuable. The iron mines, however, have always been regarded with suspicion and few people believe they will ever furnish Bessemer ore in paying quantities. All the iron deposits in this region thin out as they go down and run heavily toward sulphur. Examinations have recently been made by drills at the company's properties and may have proved that the ore is of better grade than the general reputation of the district warrants the operator to expect. The new blast furnaces are built on a very bad foundation, and their stability has yet to be demonstrated. They are, it is understood, to run as charcoal furnaces, using fuel obtained by the company in kilns built along its railway. Their success depends on bounties and high tariffs. The steel works broke down so frequently last year as to be the subject of much local amusement except to people appreciating the gravity of such stoppages; it is understood that their condition has been much improved lately, which was entirely possible by good mechanics working intelligently. The meaning of this criticism is best explained by mentioning an incident that occurred last fall. An engineer going through the machine shops noticed some men trying to perform a simple piece of work on a milling machine. On more careful examination it was discovered that the machine was incomplete, although evidently new. Enquiry of one of the leading mechanics revealed the fact that the remainder of the machine was safely boxed up elsewhere in the shop, but the parts were never put in place because nobody knew what to do with them. The engineer, out of the kindness of his heart, put the miller in shape and instructed the men in its operation.

"The ground wood pulp mill is a fair plant if kept up properly. The sulphite mill is also a fair plant if it can be divorced from the rest of the works and furnished with pyrite roasters. The company has excellent pyrites for making sulphurous acid, and could put the sulphite mill in good condition by adding a roasting plant. In the past, however, Mr. Clergue forced the pulp mill superintendent to use gas from his nickel-iron ore roasters which was too weak for the purpose, and thus made a deplorable reduction in the quality and quantity of the output. The company made some excellent pulp contracts last winter, both in the Kansas City region and in the east, but an unjustifiable application of the idea of making the by-products of one plant serve a useful purpose in another combined with other causes to render the operation of the mills a hopeless task.

"The railway has no traffic not given it by the company and passes through a region where nobody in his senses would attempt to settle. The fleet of boats is old; they are small and not adapted for profitable operation in dull seasons. The electric light and water plant in the Canadian Sault, the ferry and the street railway are considered good properties when carefully managed. Management, however, has been the one thing most lacking in the Clergue enterprises. The head men of the departments have been continually hampered in the proper discharge of their duties, money they needed for important objects has been denied them only to be thrown away on visionary schemes which students in technical schools would laugh at. The thoroughly discouraged attitude of the technical executives of the departments, owing to the autocratic management of the enterprises they were supposed to direct, was readily observed after a few weeks' residence on the spot. Really good men cannot be kept there, and this significant fact is something that should be thoroughly appreciated in the rehabilitation of the various works. If they are to be made a success, which is by no means impossible, it can only be done by men of proved ability working in sympathy with an executive who will not embark on new enterprises but confine his attention solely to the existing properties. With economical management, and possibly the abandonment of some of the works, there is good reason for believing that the company may show a reasonable profit when its securities are scaled down to their actual value and not kept at figure representing the cash spent on the various enterprises."

Capt. A. P. Chambers, assistant superintendent of the Pittsburgh Steamship Co., has succeeded Capt. Frank Rae in command of the steamer *Clemson* of the Provident Steamship Co's fleet. One of the conditions of the settlement of the controversy between the Masters & Pilots' association and the Pittsburgh Steamship Co. was the removal of Capt. Rae, who is not a member of the association—at least temporarily.

LAKE LEVEL COMMISSION APPOINTED.

As the American members of the international commission to investigate the level of the great lakes and to determine whether the level is influenced by the deepening of channels, the changing of water courses and the construction of artificial waterways, President Roosevelt has appointed Col. O. H. Ernst, corps of engineers, now stationed at Chicago; Prof. G. S. Williams of Cornell university and Mr. George Clinton of Buffalo, N. Y. Col. Ernst is, of course, familiar with lake work, having been engaged in it for several years; Mr. Clinton, well-known admiralty lawyer of Buffalo, is also specially fitted for a place on the commission; but what previous training Prof. Williams has had is not known in the lake region, though undoubtedly he has special qualities. Great Britain some time ago agreed to appoint a similar commission, but the personnel of it has not yet been announced.

The authority to appoint this commission is contained in the following provision of the river and harbor act of June 13, 1902:

"That the president of the United States is hereby requested to invite the government of Great Britain to join in the formation of an international commission to be composed of three members from the United States and three who shall represent the interest of the Dominion of Canada, whose duty it shall be to investigate and report upon the conditions and uses of the waters adjacent to the boundary lines between the United States and Canada, including all the waters of the lakes and rivers whose natural outlet is by the River St. Lawrence to the Atlantic ocean; also, upon the maintenance and regulation of suitable levels. . . . The said commissioners shall report upon the advisability of locating a dam at the outlet of Lake Erie, with a view to determining whether such dam will benefit navigation, and, if such structure is deemed advisable, shall make recommendations to their respective governments looking to an agreement or treaty which shall provide for the construction of the same, and they shall make an estimate of the probable cost therefor."

One of the points to be determined by the commission, as stated, is the advisability of the construction of a dam at the outlet of Lake Erie for the purpose of increasing the depth of water in that lake and connecting rivers. The effect of the Chicago drainage canal upon the level of the lakes will also be considered, and here the services of Col. Ernst will be invaluable. The power canals at the Sault, too, will be made the subject of investigation.

CHICAGO GRAIN REPORT.

Chicago, Oct. 7.—Grain shipments out of Chicago during the past week were much in excess of any previous period, nevertheless rates throughout ruled unchanged from the last named basis of 1 3/4 cents wheat, 1 1/4 cents corn and 1 1/8 cents oats to Lake Erie and Georgian bay points, with Kingston nominally 3 cents corn and Montreal 4 1/2 @ 4 3/4 cents. There are no new features in the trading beyond good western crop reports, encouraging eastern cash inquiry and a proposed maintenance of the reduced rate at and east of Buffalo until Nov. 1. As there is every indication of the supply of vessels keeping up with the shipping demand there is little expectation of better lake freight rates for the time being.

Of the shipments noted below for week just closed, there was via all rail lines some 236,500 bu. wheat, 155,000 bu. corn and 659,000 bu. oats; via lake to Buffalo and other American ports 204,000 bu. wheat, 2,900,000 bu. corn and 271,000 bu. oats; via lake to Canadian points 196,000 bu. wheat, 570,000 bu. corn and 65,000 bu. oats.

A summary of lake and rail shipments, as furnished by P. H. Fleming & Co., vessel and insurance agents, follows:

	This week.	Last week.	last year.
Wheat, bu	747,840	555,885	378,412
Corn, bu	3,664,655	2,800,350	1,453,140
Oats, bu	994,960	1,108,141	875,069
Rye, bu	10,890	6,260	45,365

Total, bu

	Since Jan. 1, 1903.	Same time last year.
Wheat, bu	15,624,709	25,318,931
Corn, bu	67,830,982	32,907,124
Oats, bu	50,009,546	42,808,748
Rye, bu	3,025,608	1,985,531

Total, bu

Following are figures dealing with stocks of grain in private and public elevators:

	Week just closed.	Last week.	Same week last year.
Wheat, bu	6,840,000	7,116,000	9,327,000
Corn, bu	6,862,000	6,918,000	2,174,000
Oats, bu	2,844,000	3,119,000	4,191,000
Rye, bu	586,000	483,000	356,000
Total, bu	17,132,000	17,636,000	16,048,000

The Great Lakes Towing Co. is asking for proposals for the construction of a steel lighter to be in general a duplicate of the lighter Newman, but 4 ft. longer. Plans and specifications were prepared by Mr. Robert Logan and have been sent to lake ship builders.

DULUTH GRAIN SITUATION.

Duluth, Oct. 7.—About as much grain is coming to the head of the lakes as can be expected at any time until railway main line trackage is increased. In other words, the roads coming here are bringing all the grain they can move. Receipts for the last three days have been 2,100 carloads, and when one remembers that a car load means not less than 60,000 lbs., this number of cars daily is a good deal of grain. About two-thirds or more of what is coming is wheat. The grade is badly off. Of 409 cars inspected Monday only sixty-six were of the two highest grades. More than half the entire inspection was No. 2 northern and much was rejected and no grade. Considerable "goose wheat" or macaroni is coming in and finds a ready sale. It is bought by shippers who are getting round lots for shipment east and for export.

There is a sharp demand for wheat here for shipment, though there is no export selling yet. So keen are shippers that they advanced the cash price Monday to 3 3/4 cents over December. When there was a cash premium in September it was supposed that with the close of that month and the end of the old wheat season the premium would disappear, but it is worse than ever. Not only shippers but millers, here, at Minneapolis and in the interior, are bidding for this wheat. Buyers here are chiefly eastern millers, and the stuff is going forward to them as fast as it can be put through elevators. There are less than 100,000 bu. contract wheat in New York, and there is a demand from that point that is keeping both New York and western prices above the futures.

Canadian terminal elevators at Port Arthur and Fort William have raised their charges and now get 3/4 cent for cleaning, elevating and fifteen days' storage and the same for every thirty days' storage thereafter. This move has caused considerable dissatisfaction, but there is no help for it.

AROUND THE GREAT LAKES.

Lorain, O., is to have a breakwater. Gaynor Bros., contractors, have started the work of construction.

The Thousand Island Steamboat Co. will receive \$20,000 insurance on the burned steamer Empire State.

G. E. Nesbitt, who has been shipping master for the Lake Carriers' association at Buffalo, has resigned.

A portion of new breakwater just started at Manitowoc, Wis., was wrecked by the storm of Wednesday of this week.

Capt. George McCallum of Detroit, who was in the Steel Corporation barge Carrington, has been promoted to command of the steamer Corsica.

About Nov. 10 the lighthouse officials will begin the work of substituting temporary buoys for permanent ones on Lake Michigan and Green bay.

The small steamer Adventure, owned by Chas. Beyschlag and others of St. Clair, Mich., was destroyed by fire while loading lime at Kelley's island, Wednesday.

Assets of the Prescott Elevator Co. were sold at Ottawa last week and brought \$121,000. The company's barges were sold to the New Prescott Terminal Co. for \$92,000. Creditors of the elevator company will suffer a heavy loss.

It is announced from Chicago that Charles A. MacDonald, known first on the lakes on account of his prominence in marine insurance, and who organized the Ship Owners' Dry Dock Co., has resigned the presidency of that company.

Mr. Thomas F. Griffin of Corrigan, McKinney & Co., ore shippers of Cleveland, who has been in poor health for some time past, has again left for the south, where he will spend the winter. He intends to give some attention to the company's mines in Mexico.

The schooner H. W. Sage was wrecked and lost in the straits of Mackinac last Friday. She was in tow of the steamer Samoa and sprang a leak in the severe pounding which she received. The crew was safely removed by the Samoa and shortly thereafter the Sage sank.

William E. Turnbull, an old-time marine engineer, died at his home in Detroit last week. His lake career began as engineer of the steamer William Cowle. Later he was identified with the Inter Ocean Transportation Co. and sailed both on the Merimac and Manhattan.

W. W. Waterson, superintendent for the Ship Owners' Dry Dock Co., Chicago, was in Cleveland this week. He reports a satisfactory business in repairs at the Chicago works with prospects very encouraging for the winter season, when there is most doing in repair lines.

Judge Swan at Detroit has entered an order directing the United States marshal to advertise the sale of the Barry Line steamers Badger State and Empire State on Oct. 17. Claims were presented against the Badger State for \$12,000 and against the Empire State for \$9,000.

Maj. W. H. Bixby, government engineer with headquarters at Detroit, announced this week that the survey of the new West Neebish channel had been completed and work on the channel between the American mainland and Neebish island, St. Mary's river, would be started in the spring.

Bids for repairing the east dyke of the St. Clair flats canal were opened last week by Maj. W. H. Bixby of the United States engineer corps, Detroit. There were three bidders, Charles Boston & Sons of Delray, Mich., being the lowest. The contract calls for the reconstruction of 300 ft. of the dyke.

Buffalo shippers of anthracite coal sent their product up the

lakes at a wonderful rate during September, the output for the month exceeding that of the entire year of 1902 by 32,005 tons. On account of the great miners' strike but 6,200 tons were sent forward during the month of September last year.

The passenger steamer *City of Charlevoix* of the Northern Michigan Line stranded on a reef in Northport bay Sunday morning and slid along until there was only 9 ft. of water under her bow and 13 ft. under her stern. After several attempts to pull her off with tugs it became necessary to call a car ferry to their assistance.

The steamer *City of Erie* of the Cleveland & Buffalo Line has been equipped with wireless telegraph apparatus and as soon as the De Forest Wireless Telegraph Co. has completed its stations at Nottingham, O., and Silver Creek, N. Y., tests will be made. If satisfactory, General Manager Newman has agreed to equip the *City of Buffalo* with wireless telegraph apparatus also.

The revenue cutter *Tuscarora*, which was built at the ship yard of the W. R. Trigg Co., Richmond, Va., has reached her station at Milwaukee and is under command of Capt. David A. Hall. The *Tuscarora* is a very handsome craft, her lines being especially graceful. She is 170 ft. long, 36 ft. beam and 14 ft. deep, equipped with a triple-expansion engine and Scotch boilers.

At a meeting of the Lumber Carriers' Association, held in Detroit this week, the carrying charges per 1,000 ft. on pine were advanced from \$2.50 to \$2.75 to take effect on Oct. 20. The steamers *Norseman*, W. P. Thew, Isaac Lincoln and Miami, and the schooners *Eva Robinson* and *Gebhardt*, were dropped from the association, owing to the fact that the owners felt that they could not pay the increased wages demanded by the Seamen's union.

Another large steel freighter, the *Western Star*, was launched at the Wyandotte yard of the Detroit Ship Building Co. last week. The new steamer is 435 ft. long, 52 ft. beam and 28 ft. deep. She will be equipped with triple-expansion engines, with cylinders 22, 37 and 58 in. diameter and 42 in. stroke. The owner, Capt. M. J. Cummings of Oswego, and wife, attended the launch. The *Western Star* will be commanded by Capt. P. J. Griffin, who is also part owner.

In a southeast gale on Lake Superior Sunday night the schooner *Pretoria* broke away from the steamer *Sultana* off Copper harbor. The *Pretoria* was drifting across Lake Superior when she was sighted by the steamers *Boyce* and *Gratwick* and towed to an anchorage under Manitou island. There she was found by the *Sultana* with her sails blown away, her anchor and anchor chains gone, her wheel chains parted and her windlass broken. The *Pretoria* was towed to Sault Ste. Marie for repairs.

Receipts of lumber at the Tonawanda ports during September show a large increase over the corresponding month last year and a slight increase over the preceding month. Receipts for September were 64,870,684 ft., of which 52,242,900 ft. were unloaded at the north Tonawanda port, while the balance, 12,627,784 ft., went to Tonawanda. During the present season 322,606,571 ft. of lumber have been brought down the lakes to the Tonawanda ports, or an increase of 47,099,706 ft. over last year's receipts.

Major Bingham, engineer of the tenth lighthouse district, announces that an examination will be held at his office, Buffalo, Oct. 30, at 11 a. m., for the purpose of establishing an eligible list from which second mates will be selected for lighthouse tenders. Applications must be made and submitted on or before the date mentioned, upon regular forms of the United States civil service commission, which may be obtained of Major Theo. A. Bingham, U. S. A., lighthouse engineer, 537 Federal building, Buffalo.

A controlling interest in the Manistee, Ludington & Milwaukee Transportation Co. has been purchased by W. S. Eddy of Saginaw; Robert R. Blocker, Louis Sands, E. G. Siger, Edward Buckley and R. C. Peters of Manistee, all large stockholders in the Michigan Salt association. The following officers of the transportation company have been elected: W. S. Eddy, president; Edward Buckley, vice-president; P. G. Siler, treasurer; John Kitsinger, general manager; and S. P. Reynolds, general traffic manager.

It is likely that a meeting of creditors of the Columbia Iron Works will be called next week to ascertain the progress of events and to determine whether there is any hope of reorganization. The Detroit Trust Co. is in temporary charge of the plant as receiver and efforts are now being made to have it appointed trustee with the hope that the plant may be rehabilitated. The company has been adjudged bankrupt in the United States district court upon the petition of the National Lead Co., one of the creditors, and the matter has been referred to Harlow P. Davock, referee in bankruptcy.

Another of the eight large steel freight steamers which the American Ship Building Co. has had under way for some time past at Lorain, Chicago, Bay City and West Superior yards for J. C. Gilchrist and others of Cleveland will be launched at the Lorain yard Saturday and named Joseph C. Gilchrist. The Perry G. Walker of the same fleet was launched at Chicago Saturday, and she followed the Robert C. Ireland, launched at Chicago some time ago. The R. E. Schuck, a Lorain product, has just gone into commission. The vessels building at Superior and Bay City will not be completed until very late in the season. Probably not all of these new craft will go into commission this year.

A Chicago dispatch announces that with the title of district superintendent of repairs Capt. Thomas Johnson of Chicago will have charge of the Great Lakes Towing Co's tugs at Chicago,

South Chicago, Escanaba, Sault Ste Marie, Marquette and Duluth. Capt. William Hill of similar title will take charge in Tonawanda, Buffalo, Erie, Conneaut, Ashtabula, Lorain, Cleveland, Toledo, Amherstburg, Detroit, Port Huron and Sheboygan. The two officials will have superintendence of the 140 tugs in the company's fleet. All repairs in Capt. Hill's district will be made at Ashtabula and in Capt. Johnson's at Chicago. It is also announced that Capt. Walter Hamilton, marine superintendent of the Hines Lumber Co's fleet, will be offered the management of the tug trust's tugs at Chicago and South Chicago.

SHARP ANSWER TO FORECLOSURE SUITS.

Guggenheimer, Untermyer & Marshall, as counsel for the United States Ship Building Co., and James M. Smith, Jr., receiver, have filed the answer of the company in the two foreclosure suits brought by the New York Security & Trust Co. as trustee of the \$10,000,000 of bonds given to Charles M. Schwab in part payment for the Bethlehem Steel Co. stock (which the lien covers) and by the Mercantile Trust Co. as trustee of the \$10,000,000 first mortgage secured by the other plants. Both answers set up that the bonds were executed by persons who, not being bona fide stockholders, had no power to act, and that because the constituent companies were turned in at greatly inflated values the bonds were given without consideration and are void. It is asked that both suits be dismissed. In the answer to the suit of the Mercantile Trust Co. Henry T. Scott, Lewis Nixon, John S. Hyde, E. W. Hyde, Irving M. Scott, C. J. Canda and H. W. Gause are accused of acting with the complainant and D. Leroy Dresser in planning the trust and representing their companies to be worth \$41,000,000, whereas their business was not worth over \$10,000,000 and their plants about \$10,000,000, while the assets were not in excess of liabilities and they had not sufficient working capital. They caused the concern to issue mortgage bonds and stock to the value of \$11,000,000 and in receiving \$25,000,000 of common and preferred stock became indebted to the company under section 21 of the New Jersey corporation law, and the company through the receiver is entitled to recover such indebtedness. In the answer to Schwab's suit practically the same thing is said.

D. Leroy Dresser's testimony in the case to dismiss the foreclosure suit against the United States Ship Building Co. was very sensational. He said that after a pool of 200,000 preferred and 250,000 common stock had been placed in the hands of Harris, Gates & Co., it was agreed that none of this stock should be marketed until 25,000 preferred and 25,000 common owned by J. P. Morgan & Co., and 75,000 shares of each kind owned by C. M. Schwab had been first sold. The purchase of the Bethlehem Steel Co.'s plant was discussed. Mr. Schwab, according to Mr. Dresser, wanted \$9,000,000 in cash for his stock in the steel company and submitted reports which showed that it cost him more than \$7,000,000 and was earning \$1,400,000 a year. Dresser told him they could not trade on a cash basis and Schwab said he would take \$10,000,000 in bonds at 90 for the \$9,000,000. This was agreed to, Mr. Schwab stating that \$2,500,000 of the stock was to go to J. P. Morgan & Co. For the stock of the Bethlehem company Mr. Dresser said there was really given \$10,000,000 in bonds, \$1,000,000 in common stock and \$9,000,000 in preferred. There was some talk of pooling the stock of the ship building company, he said, Mr. Schwab insisting that all the stock be held until his and Mr. Morgan's had been put on the market.

STEEL COMMON DIVIDEND REDUCED.

The newspapers make a point of the fact that John D. Rockefeller and son were absent from the meeting of the board of directors of the United States Steel Corporation at its meeting in New York on Tuesday, but there is really no point to be made on that score. The conservative element in the Steel Corporation, which include the Rockefeller holdings, has for some time past been opposed to the distribution of earnings upon the common stock, believing that the best interests of the corporation would be subserved by strengthening itself financially with an abundant surplus. Undoubtedly the reduction of the dividend upon common from 1 per cent. to $\frac{1}{2}$ per cent. quarterly is a concession to those who were in favor of a reduction three months ago and was dictated as much by prudence as it was by a decrease in earnings. It is quite likely that the $\frac{1}{2}$ per cent. was declared, instead of being passed altogether, in order to ease the effect upon the stock market; but it would not be surprising if, before the next dividend period, it should be suspended. The statement of earnings shows a decrease of \$4,642,668 for the third quarter of the calendar year, with September estimated, compared with the same period last year, and a decrease of \$4,339,487 compared with the preceding quarter of this year. On Oct. 1, 1902, the corporation had unfilled orders of 4,943,000 tons on hand. This year the unfilled orders on the same date were 3,728,742 tons. The statement for the nine months gives total net earnings, after monthly deductions for repairs, renewals, maintenance and interest on bonds and fixed charges of subsidiary companies, \$94,013,836. Deducting amounts for sinking funds on bonds of subsidiary companies and depreciation and reserve funds brings the net earnings down to \$82,211,692. A further deduction of interest on the corporation's bonds, including the sinking fund, leaves a balance of \$85,978,217. Dividends on the preferred and common shares for the nine months aggregate \$36,629,475, leaving a balance of undivided profits or surplus for that period of \$29,348,742.

VERTICAL WATER-TUBE BOILERS.

By Geo. W. Ramage.

That more attention has not apparently been given to the advantages of the vertical water-tube boiler, especially for marine use, by engineers, ship builders and owners seems somewhat of a mystery, inasmuch as such advantages were recognized and cited by competent judges as far back as 1859. In June of that year experiments were made by order of the navy department on board the United States screw frigate San Jacinto, at the New York navy yard, "to determine the relative evaporative efficiencies of the horizontal fire-tube and the vertical water-tube boiler." These experiments were carried on by Chief Engineers B. F. Isherwood, Wm. E. Everett, James W. King and John Faron, a full report of which will be found in Engineering Precedents for Steam Machinery, Vol. 2, by B. F. Isherwood, chief engineer United States navy, published in 1859, from which some extracts are taken. That the tests should be purely between the two types of boilers, one of each of similar capacity was installed on board the vessel, the furnaces being exact counterparts. I quote from the report:

"In order that the tests should be rigorously comparative under the conditions of actual practice on board marine steamers the experiments were made by operating the engines and screw with the vessel secured to the dock and measuring the weight of steam discharged from the cylinders at the end of the strokes of their pistons by means of the indicator. In making the experiments every precaution was taken to insure exact similarity of circumstance with both boilers. The same indicators (one permanently fixed to each engine), thermometers, gauges and scales were employed; and the same firemen fired both and were di-

says: "Hence, we perceive that the vertical water-tube boiler had the great superiority of evaporating with the same fuel 17 2-3 per cent. more water than the horizontal fire-tube boiler. And at the same time it produced 6½ per cent. more weight of steam in equal times."

The report goes on to say: "In the case of the experimental boilers, it will be observed that both being new the surfaces of their tubes were equally clean. The vertical water-tubes can be maintained in this state; the horizontal fire tubes cannot. Were the experiment to be repeated after the lapse of a year, the gain of 17 2-3 per cent. by the vertical water-tube boiler would probably be found increased to 20 or 25 per cent. due to the difference in cleanliness alone."

As to accessibility for cleaning the report says: "The vertical water tubes have a decisive superiority from the complete and easy manner in which they can be reached by a scaling tool and cleaned mechanically."

Regarding durability it says: "The experience of several years with the boilers of a large number of United States steamships has not shown the failure of a single vertical water-tube, and they are now apparently in as good condition as ever."

Finally: "It is clear from the foregoing comparison that the superiority is so great of the vertical water-tube boiler both in potential and economic evaporation, and in the facility and completeness with which its heating surfaces can be scaled—the qualities of paramount importance with marine boilers—that unquestionably it should be preferred to the horizontal fire-tube boiler."

The reason for the superiority of the vertical over the horizontal style of tubing for obtaining maximum benefit of heat and generating steam is clearly explained by Isherwood as follows: "With the vertical water tubes there is found, as with

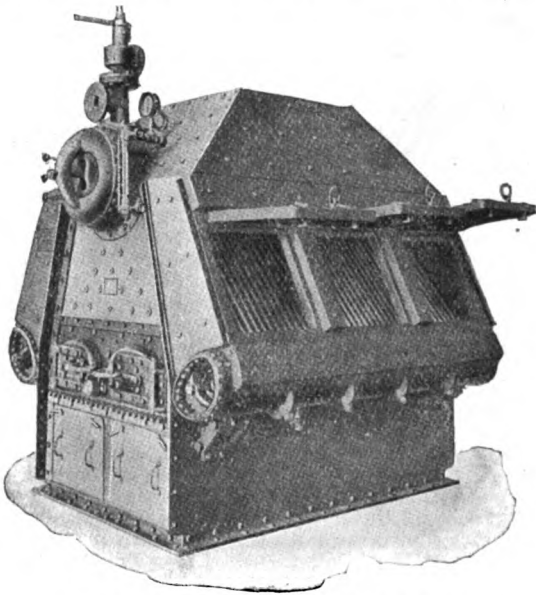


Fig. 1.—The See Vertical Water-Tube Boiler, Single High Furnace Pattern.

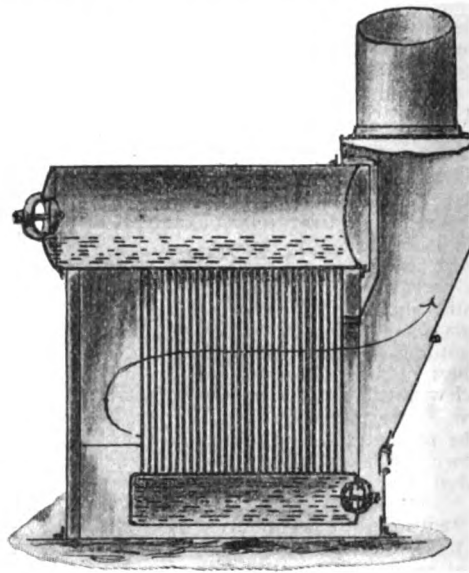


Fig. 2.—Longitudinal Section of The See Vertical Water-Tube Boiler, Double High Furnace Pattern.

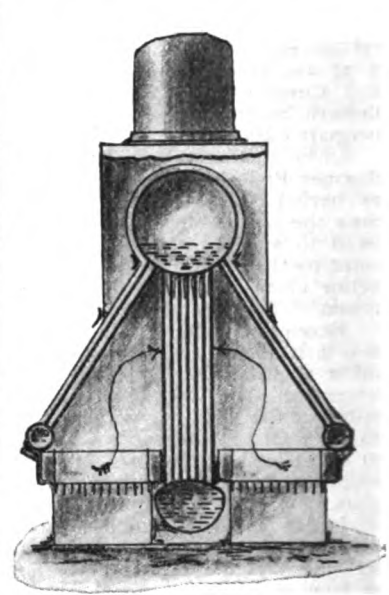


Fig. 3.—Cross Section of The See Vertical Water-Tube Boiler, Double High Furnace Pattern.

rected by the same assistant engineers. The cut-offs, set to suppress the admission of the steam into the cylinders at 48-100 of the stroke of piston from the commencement, were secured to prevent accidental alteration; and the throttle (a butterfly valve) was kept unchanged at two holes open on the arc, eight holes being wide open.

"The experiments with both boilers were begun and concluded at midday. They were first made on the horizontal fire-tube boiler, commencing at noon on June 10 and ending at noon on June 14, at which time precisely—the steam in the vertical water-tube boiler having previously been raised for some time blowing off, and the fires brought to steady action—the screw stop valve of the horizontal fire-tube boiler was closed and that of the vertical water-tube boiler opened without stopping the engines, and the experiments continued without interruption until they ended at noon on June 18. They thus embraced exactly ninety-six consecutive hours with each boiler.

"The experiments were conducted in precisely the same manner with both boilers. At the commencement they were filled with sea water, and no account was taken of its temperature, or of the weight of fuel required to raise the steam to a pressure of 22 lbs. per square inch above the atmosphere; but as soon as it reached that point the height of the water was noted upon the glass water gauge, the condition of the fires was carefully observed and the engines were started. At the end of each experiment the height of water and the steam pressure in the boiler were left the same as at the commencement, as were also the condition of the fires as nearly as could be estimated by the eye. The indicators were large, excellent instruments, and had been properly tested and put in complete order for these experiments; they worked very satisfactorily and gave smooth-lined diagrams in whose correctness it is believed every confidence may be placed."

In summing up the results of these experiments the report

the horizontal fire tubes, a considerable difference in the temperature of the gases emerging from around the upper part of the tubes and from around the lower part. This difference, though due to the same cause as in the case of the horizontal fire tubes, is not so great; for although the upper part of the vertical water tubes, like the upper rows of the horizontal fire tubes, is surrounded by mere foam, while the lower part is immersed in comparatively solid water, yet as the two parts, unlike the top and bottom rows of the horizontal fire tubes, are the same piece of metal, the heat of the top strata of the gases not absorbed by the foam surrounding the upper part of the tubes, instead of passing off to the chimney, is, in large measure, carried downward by the conductivity of the metal to the solid water beneath, which absorbs it and thus obtains from it its proper evaporative effect." To this conductivity of the metal he also ascribes safety in the vertical water tube in case of low water as follows: "A much less depth of water may with safety be carried over the vertical water tubes than over the horizontal fire tubes; for if the former be left uncovered the conductivity of the metal will rapidly carry off the heat to the water below and preserve the tube from injury, while if the upper rows of the latter be left uncovered for even a very short interval, they will be burned out and ruined."

With such strong commendation from such eminent authority one wonders why the thought and efforts of inventors and builders of steam boilers have not been concentrated on the line of the vertical water-tube type. But, after all, the ways of man are, quite often, like the ways of Providence, past finding out. Therefore I will not venture a reason for this seeming neglect, unless it be a predisposition to eschew authorities and ignore precedents. However, it would seem that the possibilities of this type of boiler have not been entirely neglected, as the illustrations given herewith will demonstrate. These show the latest improvements in the vertical water-tube boiler, both single and

double furnace, as manufactured by the See Engineering Co. of New York.

This boiler is the invention of Mr. Horace See, well-known naval architect and engineer of New York. It is an improvement on the vertical water-tube boiler used on the San Jacinto—in experiments mentioned—both as to tubes and furnace. One of its principal features is a high combustion chamber into which the gases are brought together from opposite furnaces—instead of keeping them apart as has been the practice heretofore—where perfect combustion ensues before passing through the nest of tubes. After a thorough mixing in the combustion chamber the hot gases are reversed at right angles into a single nest of tubes arranged in a long lane where the course is sufficiently extended and resistance ample to extract the heat before reaching the smoke-box, thereby obtaining the benefit of all the heat possible from fuel consumed and obviating flaming or smoking at top of smoke-stack, all being essential requirements to a perfect boiler, as attested by high authorities.

Rankine says: "A high furnace is favorable to combustion." Bertin's conclusions on the subject are: "In order to ensure good combustion a large combustion chamber is needed," and "modern practice has revealed the necessity for thoroughly mixing the hot gases." Robertson says: "Gases must not enter the nest of tubes before combustion is complete," and "gases should be forced to remain as long as possible in contact with the tubes." In regard to vertical tubes he says: "Heating surface that is transverse to the normal path of the gases is usually considered more efficient than that which is parallel to it." To this Isherwood has added: "The superiority of evaporating surfaces arranged in vertical water tubes immersed in and lying at right angles to the currents of the products of combustion is so great in every respect that when it becomes properly appreciated the arrangement in horizontal fire tubes will doubtless be definitively abandoned." In speaking of circulation in boilers, Engineering of London, in its issue of July 18, 1902, said: "Water-tube boilers with vertical, or approximately vertical, tubes are superior in this respect to those with horizontal, or approximately horizontal, tubes."

I have merely quoted these authorities to show that the simple elements combined in the boiler illustrated have long since been well tried and understood, but the difficulty seems to have been to get the proper combination requisite to perfect combustion and superior steam-producing qualities; with simplicity of construction, safety, durability and economy of operation, which, judging from tests, has been accomplished in the boiler under consideration. It does not require expert knowledge on the subject to know that water and steam naturally take the course of least resistance, and hence it is apparent to the novice—as the tendency of hot water and steam is upward—that the resistance in a vertical tube is not to be considered with that met with in a horizontal one, where circulation is necessarily restricted, inviting the deposit of foreign matter at dead points, and thus interfering with steam production and tending to an early destruction of the boiler.

In the vertical water-tube boiler illustrated it will be seen that there are no dead points to invite deposit of foreign matter, nothing to impede circulation, and that the tubes are really in suspension leaving them free to expand, thus permitting the use of longer ones than possible where tubes are subjected to compression. The flexibility thus obtained should be of great advantage in marine service, as it would render the boiler less liable to injury from any jar that might be occasioned by the vessel coming in contact with another object or the concussion from a gun fired on board. It will also be observed that the water pockets—which are also settling chambers—being located out of range of the extreme heat of the gases, and being of ample size, obviate the possibility of the deposit of any foreign matter in the tubes, to cause their deterioration or destruction; access to these pockets being easily made through man and hand holes.

Another noticeable feature is the absence of caps or lantern ends to the tubes, therefore, no caps to crack and spring a leak or lantern ends to require constant watching or get knocked off by accident. In fact, it will be noticed that the only openings to be kept tight, outside of water and steam connections, are two man holes and two hand holes, the covers to which are ingeniously fitted from the inside, thus all pressure from within only tends to tighten their joints and relieve all strain upon fasteners. The absence of rivets and stays is another commendable feature out of the ordinary.

The double furnace arrangement is well worthy of note, as through it the influx of cold air is confined to the particular furnace to which the door may be open for feeding, and the position of the tubes in relation to the furnace is seen to be most favorable for protection from cold air at such times, as those liable to be directly affected from such a cause lie on the outside of the current and parallel to its weakest movement. Consequently the cold air entering the furnace meets with little resistance until it reaches the heated brick back at the end, where, its temperature being raised, it is diverted into the combustion chamber and thence into the nest of tubes.

One important claim for this boiler is that it is not liable to injury from the well-intentioned but misdirected efforts of untrained firemen. This of itself is a big recommendation, as all users of steam boilers, especially on board ship, are well aware what a veritable "bull in a china shop" the average unskilled fireman can be in a boiler room. On this subject Chief Engineer of the Navy Melville, lately retired, mentions in one of his reports the fact that "the chief difficulty in keeping boilers in the

navy in good shape is on account of inexperienced firemen."

Other features to commend it is that it is adapted to burning either solid or liquid fuel; minimum amount of repairs, which can be made by ordinary workmen with ordinary tools; and in the double-ended variety is of less weight and occupies less floor space than other styles of like caliber. And last, but perhaps not least, while safe, economic and durable, it costs no more than the ordinary kind.

THE HUDSON RIVER IN AUTUMN.

At no other season of the year is the gorgeous scenery along the Hudson river so enchanting to the beholder as in autumn, reaching its climax in October. At this season the foliage along the picturesque banks of the mighty stream has taken on beautiful tints of the rainbow, making a bewitching panorama in colors which once viewed is never to be forgotten—a lasting picture of beauty and grandeur. Here is to be seen nature at her best, with hill, vale and mountain painted in colors such as only nature can paint, and demonstrating how crude is the effort of man to portray nature's handiwork on canvas. The enchantment of the scenery, ever changing from one scene of beauty or grandeur to another, easily enables the voyager coursing the river to imagine him or herself passing through a fairyland. Added to the scenery, and only second in importance thereto, are the many historical landmarks along the banks between Albany and New York, calling up afresh to the mind the immortal struggle for American independence and the gallant patriots who participated therein.

In order to view this scenery to advantage one must take one of the palatial steel steamers of the Hudson River Day Line, leaving Albany and New York—the terminal points—about 8 a. m. every day except Sunday, during the season, which closes about Oct. 28 each year. These boats are a pleasant surprise to people accustomed to western river craft, running without vibration. Besides being the fastest river steamers afloat, they are elegantly appointed throughout. Through railroad tickets via Albany are good on these steamers. Ticket agents can furnish particulars. No one going to New York via Albany, or returning, should miss this river trip of the world.

CANAL FROM BALTIC TO BLACK SEA.

It is stated in Europe that an American syndicate has proposed to the Russian government to construct a canal from the Baltic to the Black sea for the sum of \$160,000,000, which is one-third less than the official estimated cost. The junction of its great northern and southern seas by a navigable estuary of sufficient width and depth to permit the passage of men-of-war and ships of great tonnage has long been a favorite project in the councils of the czar. At the present stage of the undertaking there are two plans of procedure. One is to utilize the existing Beresina canal by widening, deepening an generally extending it, and the other to adopt a perfectly new route altogether. According to the *Umland Verkehrszeitung*, the plans of the canal have been recently deposited with the minister of ways and communications, in which the proposed new route has been minutely and fully defined. The canal will begin at Riga, which, next to St. Petersburg, is the most important of the Baltic ports in Russia. It will avail itself, wherever practicable, of such portions of rivers, canals and other waterways it may meet with in its course as can be made to profitably contribute to the success of the whole undertaking. For 125 miles it will absorb a part of the channel of the Divinea, as far as the fortified town of Dunaburg. Thence it will run through a deep straight cutting 100 miles long, and join up with the river Beresina at Lepel. From this point it will follow the canalized river to its junction with the Dneiper, and use the latter stream for the rest of its course to the Black sea at Kherston, to the west of the Crimea, near Odessa. From the one sea to the other the distance will not be less than 1,000 miles by the new scheme of inland navigation. The cost of construction, according to the offer made, would amount to £32,000 per mile, which is not an unreasonable price to pay. In addition to the value of the canal as a considerably cheaper route for the transport of goods, it would in war time possess a strategic importance probably exceeding that belonging to the Kaiser Wilhelm waterway. It is calculated that Russian armorclads could thus navigate the kingdom from sea to sea in half a dozen days.

A distribution of between \$35,000,000 and \$40,000,000 of the 5 per cent. sinking fund bonds of the United States Steel Corporation was made last week to the members of the syndicate which guaranteed that under the plan for the conversion of \$200,000,000 of the corporation's 7 per cent. preferred stock into bonds and the sale of \$50,000,000 additional bonds for cash \$100,000,000 of bonds would be issued. The syndicate guaranteed that it would furnish, if need be, \$80,000,000 of preferred stock for conversion into bonds and in addition would take \$20,000,000 of the bonds for cash. It has been reported that the stockholders of the corporation turned in for conversion about \$43,500,000 of preferred stock, which left it to the syndicate to convert \$36,500,000 of preferred stock into bonds and to take for cash \$20,000,000 more bonds in order to keep its \$100,000,000 guarantee.

The barge Montezuma of the Davidson fleet ran aground four times in a recent round trip, three times in the Detroit river and once in St. Mary's river.

FAVORS A SHIP-CANAL.

Editor Marine Review:—I find on returning to the city you have been kind enough to notice my letter to the Railroad Gazette on the barge canal project, with certain objections to it. As Col. Symons apparently gave out his interview on this subject without having read my letter, and hence under misapprehension, may I quote from that letter, viz:

"It is not intended to question the skill and care with which our state engineer has made up his estimate." * * * "Nor do I doubt that if Mr. Bond could live and be retained in office until the completion of the canal he would save as considerable a percentage on its estimated cost as the engineers of the United States government do on their estimated costs of improvements." * * * "The history of canal construction and canal improvements justifies me in the prediction that the proposed barge canal will not be completed for less than \$150,000,000." After the table showing the nine works on which the actual had exceeded the estimated cost by 59 per cent. it was stated: "The Champlain and some other canals, in all of which the cost exceeded the official estimates, are not included, as considerable changes in plans were made requiring a misleading comparison."

It is unthinkable that Col. Symons had the above quoted sentences in his mind when he expressed his desire to undertake, under guarantee, the completion of the canal for less than its estimated cost, as an argument against my position, particularly as I had referred to the results of political and other obstructions "in the twenty or more years during which time the canal will be under construction," as the reason for the increased estimate. Acknowledging Col. Symons' courteous assertion that I might be one of the five engineers which the governor may appoint as an administrative board, it has more than once been explained to me that if I did not stop opposing the barge canal project there was no probability of my receiving one of those appointments.

As an engineering estimate, the sufficiency of the estimate for which State Engineer Bond is responsible has not been questioned by me. I doubt if it will be questioned by any one. But the historic fact should be presented that no canal work in this state is known to be of record the construction of which extended into a second administration without the estimated cost being greatly exceeded. No engineer should be asked to either provide against successful political hostility or to calculate its cost. Possibly a constitutional amendment could insure the continuous prosecution of the work and defend this expenditure against spoliation. Probably the politicians of the state would work through even this defense. An act of the legislature would be a cobweb to them.

In a letter of the 15th inst. Prof. Burr of Columbia university says such considerations are "superficial," and apparently thinks himself better fitted by experience or otherwise to decide on the ultimate cost of a canal through this state than such men as John B. Jervis and William J. McAlpine were in their day. The value of the two views can be better determined at the close of the work than at present. The relative values, as channels of transportation, of the barge canal and a ship-canal, to which the professor refers, are not so much a matter of opinion as the future result of politics. And though you may not agree with my conclusions I trust you will afford me an opportunity to put before your readers a statement of the advantages possessed by the more capacious channel.

In the first place the fiction that "it is impracticable to construct ships suitable to navigate the great lakes and the ocean" may be immediately dismissed in the presence of the active advocacy of the barge canal by nearly all agents of foreign-owned shipping in this port, who are undeniably helping those "friends of the canal" who committed the state to the \$9,000,000 enlargement. Nothing but fear of competition from the lake fleet can account for their activity, as there is probably not a ship builder in the world who would not be glad to contract for vessels guaranteed to make equal, if not better, speed on the ocean than on the lakes.

Prof. Burr truthfully says: "The longer that contracted waterway the less the carrying capacity of a lake or ocean vessel navigating it." In a paper, "Canals between the Lakes and New York," read by Mr. J. Mayer, C. E., before the American Society of Civil Engineers, he says: "The cost per ton-mile of running a vessel through the canal is larger than that on the lakes in the proportion that the time required to pass through the canal is larger than that for an equal distance on the lakes." It seems impossible to question this. The late Elanthan Sweet (see "Report on Barge Canal" p. 609) estimated this retardation as 30 per cent. where the cross section of the canal is 4.75 times the immersed cross section of the boat, and the engineers on deep waterways assumed 20 per cent. on a ship-canal, with a ratio of 5 to 1. If we take the lake freight rates returned by Maj. Bixby as 0.89 of a mill per ton-mile, the average rate including loading and unloading, paid on the 36,000,000 tons of freight passing the Sault in 1902, we will find that the additional cost due to retardation on the basis of 30 per cent. instead of 20 on a ship-canal between Buffalo and Albany, 350 miles, will be almost 9½ cents per ton carried. If the cost of transfer at Buffalo was not greater than this, would there be any professional friends of the canal?

Mr. Sweet, in discussing Mr. Mayer's above quoted paper, says: "There are three fundamental and controlling elements of advantage in the deep waterway: First, the elementary physical law, that the resistance to motion to vessels of like model va-

ries directly as their immersed surfaces, while their tonnage varies as the cubic contents of their immersed section, ensures enormous economy in barge boats; second, the obvious and controlling advantage of passing from terminal to terminal without transfer of cargo; third, a large fleet adapted to the navigation of the deep waterway already exists, while, to put the smaller canal into operation, a new marine equipment must be created, for which there could be little use elsewhere."

If we build a barge canal, while it will annoy the parallel railroads, it can not materially decrease freight rates; it will not develop any large industries on its banks. A ship-canal from Buffalo to Albany will fill the state with manufacturing establishments and greatly reduce the charges on all coarse freights, at the same time adding to the revenues of competing railroads by increasing their passenger and package freight business. And though about 80 per cent. of the money expended for either canal would remain in this state, a barge canal would be paid for entirely by direct taxation on the inhabitants of this state, while a ship-canal would be paid for by indirect taxation on the people of the whole country.

If we build a ship-canal the Canadians probably will not build one, and the outlet of not only our own, but of the Canadian northwest will be through the port of New York. If we build a barge canal the Canadians will doubtless build a ship-canal via the Ottawa, and the outlet of our own and the Canadian northwest will be through Montreal. This is not a convenient route for the people of the United States and would necessitate our improving the Lake Champlain route, making an Ireland of Central and Western New York.

EDWARD P. NORTH.

New York, Sept. 22, 1903.

SHIP YARD NOTES.

The steamship Decatur H. Miller of the Merchants & Miners' Transportation Co., plying on the line between Philadelphia and Savannah, has been taken to the dry dock of the Baltimore Ship Building & Dry Dock Co. to have 25 ft. inserted amidships. The Miller is 257 ft. long, 38 ft. wide and 16 ft. deep.

Robert Palmer & Sons, Noank, Conn., are building a fine wooden screw steamer for the Fischer's Island Navigation Co., for traffic between New London and Fischer's island. The plans were drawn by H. J. Gielow, naval architect of New York. The new vessel is to be 150 ft. long, 30 ft. beam and 17 ft. deep.

The Gas Engine & Power Co. and Charles L. Seabury & Co., Consolidated, Morris Heights, N. Y., is building a cruising yacht for Charles A. Dean of Boston, Mass. She will be 80 ft. over all, 77 ft. on the waterline, 18 ft. beam and 3 ft. draught. The yacht will be fitted with two triple-expansion engines, with cylinders of 6, 9¼ and 15½ in. diameter and 9 in. stroke, supplied with steam from a Seabury water-tube boiler. She will have a speed of 10 miles an hour.

In the yard of William McKie, East Boston, Mass., keel has been laid for a steamer which is to replace the Mt. Desert in the Eastern Steamship Co.'s service between Rockland and Bar Harbor. The new steamer is to be ready for business next June. She is to be 200 ft. keel and 214 ft. over all, and is to be built on much the same model and general plan as the City of Rockland. As she is to be a day boat, everything will be sacrificed for deck room. Her stateroom accommodation will be very limited.

CANADIAN MARITIME NOTES.

Plans are being prepared for the construction of a steel ferry steamer 140 ft. in length for the St. John, N. B., city council.

Capt. S. Hill has been appointed to the command of the steamer Tadousac, recently completed for the Victoria Harbor Lumber Co., by the Bertram Engine Works Co., Toronto.

Harbor commissioners of Montreal are considering plans for the erection of three-story steel sheds on the Montreal wharves. The cost of these sheds is estimated by the engineer at \$2,807,000. against \$2,432,000 for two-story sheds.

The steel screw steamer Neepawah has been launched on the Clyde, Scotland, for the New Ontario Steamship Co. of Hamilton, Ont. Her dimensions are: Length, 253 ft.; breadth, 40 ft.; depth, 16 ft. molded to main deck. She will be fitted with triple-expansion engines of 1,000 H. P. and will be put into the package and general freight trade on the great lakes.

The Ottawa Forwarding Co. has placed an order with J. & R. Weir, Montreal, for a steel screw boat for freight and passenger service on the Rideau canal between Kingston and Ottawa. The new steamer, which is intended to replace the Olive on the service, will be 107 ft. long and will have capacity for 150 tons of cargo. Her draught will be 4 ft. 6 in.

A steamer named Commodore Jarvis has been built at Hamilton, Ont., for the Sand & Dredging Co., Ltd. This company supplies lake sand for builders' purposes, and the steamer is to be used for dredging the sand from the lake bottom and bringing it into Toronto. She has the following dimensions: Length, 116 ft.; breadth, 27 ft.; depth, 6 ft. She has a capacity for 225 cu. yds. of sand. She is fitted with twin screws and an 8-in. centrifugal pump.

San Francisco and Los Angeles.—Via Nickel Plate Road. Greatly reduced fare Oct. 7 to 16 inclusive. Tickets good to return till Nov. 30, '03. Get special features including stop-over privileges, etc., from nearest Agent or address E. A. Akers, C. P. & T. A., Cleveland, O.

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COAL PRODUCTION IN THE UNITED STATES.

Edward W. Parker, the geological survey expert, who was selected by the president to serve on the anthracite coal strike commission, has just completed an interesting review of coal production in the United States during 1902, of which the following is a summary:

For the first time in the history of the United States the production of coal has reached a total of over 300,000,000 short tons, showing an actual output of 300,930,659 tons of 2,000 lbs., valued at \$373,133,843. Of this total the output of anthracite coal amounted to 36,865,710 long tons (equivalent to 41,289,595 short tons), which, as compared with the production of 60,242,560 long tons in 1901, shows a decrease of 23,376,850 long tons, or almost 40 per cent. This decrease, as is well known, was due entirely to the suspension of operations by the strike in the anthracite region from May 10 to Oct. 23, a little over five months. Had it not been for the strike, which practically stopped production in the anthracite region for this length of time, the output for the year would have probably attained a total of over 65,000,000 long tons. The value at the mines of the product in 1902 amounted to \$81,016,937, as against \$112,504,020 in 1901, a loss of about 27 per cent. The average value of the marketed coal sold during the year at the mines was \$2.50 per long ton, the value in 1901 having been \$2.05. The comparatively small amount of anthracite which was mined during the strike, and which brought such exorbitant prices, did not have the effect on the total production that might have been expected.

A large part of the shortage caused by the strike in the anthracite region was made up by the use of bituminous coal and of coke. The shortage was, however, not entirely made up, as many factories, unable to procure any fuel whatever, or, if at all, at prohibitive prices, were obliged to close down entirely and were unable to resume until prices for fuel again approached normal conditions. The output of bituminous coal (which includes semi-anthracite and all semi-bituminous and lignite coals) amounted in 1902 to 259,641,064 short tons, valued at \$292,116,906, as against 225,826,849 short tons, valued at \$236,406,449 in 1901. The increase in the production of bituminous coal was, therefore, 33,814,215 tons in quantity, and \$55,710,457 in value.

Out of thirty states and territories in which coal was produced in 1902 there were only seven in which the output was less than in 1901. These seven exceptions were California, Michigan, New Mexico, Oregon, Pennsylvania, Texas and Washington. The production of bituminous coal in Pennsylvania in 1902 exceeded that of 1901 by 15,755,874 short tons, but was not sufficient to overcome the great loss in anthracite production. The states in which the more important increases occurred were Illinois, which gained 5,547,751 short tons, or a little more than 20 per cent. over 1901; Colorado, whose increase was 2,314,412 short tons, or

over 40 per cent.; Ohio, a gain of 2,444,577 short tons, not quite 12 per cent.; Indiana, with an increase of 2,268,371 short tons, or nearly 33 per cent.; Alabama, with a gain of 1,490,865 short tons, or 16 per cent., and Kentucky, whose output increased 1,193,176 short tons, or a little over 20 per cent.

ANOTHER REASON FOR AMERICAN SHIPS.

A correspondent who is an enthusiast on the subject of government aid to our foreign-trade shipping sends the following note from the London Daily Mail, which was furnished by its Odessa correspondent:

"Four cruisers of the Russian volunteer fleet, which have been rendered superfluous for the Far Eastern trade by the opening of the Siberian railway, have been selected to open the new Russian steamship line between Odessa, Naples and New York. The officials of the line are confident that their vessels will capture the bulk of the emigrant traffic from Naples. The first steamer, the St. Petersburg, has just been equipped at Nicolaief for emigrant traffic. She will sail next week."

"The foregoing dispatch," says our correspondent, "points to another of the many reasons why congress should come to the aid of our shipping interests. If we are to find free homes for these people, we ought to have at least the benefit of their passage-monies."

Hunters' Special Rates.—Via Nickel Plate road to points in northern Michigan and Wisconsin. Tickets on sale Sept. 15 to Nov. 15, '03, inclusive. Liberal return limit. See nearest agent for particulars or address E. A. Akers, C. P. & T. A. Cleveland, Ohio. Oct. 23 (173).

Dredging Plants for Sale.

For Sale.—Two dredging plants complete, consisting of two dredges, tugs Maytham and Duncan Robertson; also five dump scows and two flats, with sundry duplicate parts of machinery, etc.; also extra spud anchors and dipper teeth, etc.; all having been kept up in good working condition and comparatively new, and could be delivered at once on satisfactory sale. For further information as to capacity and prices of each plant inquire of James Pryor, Houghton, Mich. Oct. 1

BELLEVILLE WATER-TUBE BOILERS

NOW IN USE (SEPTEMBER, 1903)

On Board Sea-going Vessels, NOT INCLUDING New Installations Building or Erecting.

French Navy	-	-	-	-	-	-	-	355,560	H. P.
English Royal Navy	-	-	-	-	-	-	-	929,300	"
Russian Imperial Navy	-	-	-	-	-	-	-	227,500	"
Japanese Imperial Navy	-	-	-	-	-	-	-	122,700	"
Austrian Imperial Navy	-	-	-	-	-	-	-	56,700	"
Italian Royal Navy	-	-	-	-	-	-	-	13,500	"
Chilian Navy	-	-	-	-	-	-	-	26,500	"
Argentine Navy	-	-	-	-	-	-	-	13,000	"
The "Messageries Maritimes" Company	-	-	-	-	-	-	-	87,600	"
Chemins de fer de l'Ouest: (The French Western Railway Co.)	-	-	-	-	-	-	-	-	-
plying between Dieppe and Newhaven	-	-	-	-	-	-	-	18,500	"
Total Horse Power of Boilers in Use	-	-	-	-	-	-	-	1,850,860	

Societ  Anonyme des Etablissements Delaunay Belleville

CAPITAL: 8,000,000 FRANCS

Works and Dock Yards of the Ermitage at Saint-Denis (Seine), France. Telegraphic Address: Belleville, Saint-Denis Sur-Seine

SHIP BUILDING IN JAPAN.

From a ship building standpoint Japan is each year becoming less dependent upon other countries. At Nagasaki, the seat of Japanese ship building, improvements are constantly being made. Mr. John B. Bentiers, in a consular report to the British foreign office, indicates the progress Japan is making in industrialism and in the ability of the race to imitate and apply western methods—to do, in fact, for itself in the future the technical and scientific work which it has had done in the past in Britain and elsewhere. The present position of the works at Nagasaki is thus described by the British consul:

"By an extension, and also by a rearrangement of the ship building yard, it now contains eight berths, on which as many ships, ranging from 170 ft. to 700 ft. in length, can be built at the same time, and at a little extra expense in cutting away the hill at the back of the yard, two ships of 1,000 ft. each could be built alongside of each other. The building capacity of this yard has been increased, and it is now able to turn out vessels of an aggregate gross tonnage of 20,000 tons in the year. The ship building yard possesses an extensive pneumatic plant for riveting, caulking, clipping and cutting plates, etc. A much larger plant has, however, been ordered, and when this is set up it is intended to remove the present plant to the machine shop. The plans for the dock mentioned last year as being in course of construction have been enlarged. The intention now is to give it a length of 714 ft. on the keel blocks, with a breadth at the entrance at the top of 96 ft. 7 in., and at the bottom of 88 ft. 7 in.; depth of water at ordinary spring tides, 34 ft. 6 in. It is further the intention not to build up the dock-head, and the length of the dock can be readily extended by further cutting away of the hill-side into which the head of the dock is cut. Forty machines of the newest patterns were installed in the machine shop last year. These included a planing machine to plane 21 ft. horizontally and 18 ft. vertically; a 54-in. center crank shaft lathe; a 30-in. center gap lathe; two 24-in. center shaft lathes, having a common center line to turn a shaft up to 67 ft. in length; one 5½-in. spindle double universal horizontal drilling, boring, tapping, studding and milling machine to move 10 ft. vertically and 15 ft. horizontally; a cylinder boring machine, to bore cylinders up to 100 in. diameter. About forty more new small machines have been acquired up to date. In the boiler shop, electric shell drilling machines, screwing machines, and a plate roller for rolling plates up to 2 in. thick by 11 ft. 9 in. wide have been set up, and a duplicate of the 40-ton overhead electric traveling crane set up last year has been ordered. The foundry shop as previously enlarged being insufficient, a further extension of 102 ft. by 50 ft. has been made to be used for brass founding only; the part hitherto used for that purpose being added to the iron foundry. The heaviest casting made at these works was one of 22 tons, and it is improbable that it will be repeated, the practice being to reduce the size of individual castings by making them in sections, which greatly increases the facility of handling the new casting, to which the weight of the mold adds enormously, and also reduces the risk of loss in case of misadventure; 50 tons of casting can be easily turned out in a day. Steel castings are not made here, and such as are required, as, for instance, stern frames for steamers, are obtained from the United Kingdom. Small steel castings can, however, be made at Osaka. Steam power in all parts of the works is rapidly being superseded by electricity and compressed air. The reason for this is the scarcity of water on that side of the harbor, which necessitates water being brought to the works by boat at an annual cost of £2,000. The electric power house is furnished with condensing apparatus

for recovering the water employed by the steam engines in driving the dynamos. Among the vessels completed last year at this yard is a salvage steamer of 712 tons, with a speed of 12 knots, fitted with all the necessary pumps and gear of the most powerful description. With this and with its large staff of experienced workmen and divers, the company is prepared, at short notice, to undertake salvage operations. When not engaged in salvage operations, this steamer is employed as a passenger boat, making trips on fixed days to places on the neighboring coasts and outlying islands. On the last day of December, 1902, there were 5,245 workmen employed in the works. During 1902 four steamers were completed, of an aggregate gross tonnage of 8,361 tons."

FIFTIETH ANNIVERSARY OF THE SHERIFFS MFG. CO.

In June next will occur the fiftieth anniversary of the establishment of the Sheriffs Manufacturing Co., Milwaukee, Wis., by the late James Sheriffs. The business of the company as makers of propeller wheels and marine machinery has grown steadily during the years that have passed. Since December 1 last the company has made 137 wheels in all sizes from 20 in. to 13 ft. 6 in. and has during its existence made 2,310 wheels. The company completed in August last the machinery for the tug Burger for Capt. John Coffey, of Manistique, Mich. The tug is named after the well-known ship builder, Henry Burger of Manitowoc. The diameter of the engine's cylinder is 18 in. and stroke 20 in., all complete as to pumps, inspirator, etc. The boiler was built by the Manitowoc Boiler Works and is 7 ft. in diameter by 12 ft. long, allowed a pressure of 150 lbs. The diameter of the wheel is 7 ft. The company has been very busy of late in steamship repair work.

M. B. McDonald & Son, Mystic, Conn., have closed a contract to build a four-masted schooner for Capt. C. A. Davis of Somerset, Mass. The new schooner will be 161 ft. long, 36 ft. wide and 13 ft. deep. This firm will also build a duplicate of the three-masted schooner John Booth of New London, which was sunk in Long Island sound recently by the steamer H. M. Whitney. Carlos Barry of New London will be the managing owner of the new vessel.

For Sale.

Tug Duncan City. Address, Geo. Pankrantz Lumber Co., Sturgeon Bay, Wis. t. f.

FOR SALE. SMALL CANADIAN STEAM BARGE ARCTIC

ADDRESS OR CALL ON

SAND & DREDGING, LTD.,

TORONTO, CANADA.

Oct. 15.

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Seaboard Steel Casting Co.,
Chester, Pa.



NEW METAL CARGO HOISTERS

Wrought Iron Hook and Strap, Galvanized Iron Shells and Sheaves. Sheaves fitted with Genuine Star Metaline Bushings with Metaline Side Bearings.

Star Metaline Bushing.

SELF-OILING.

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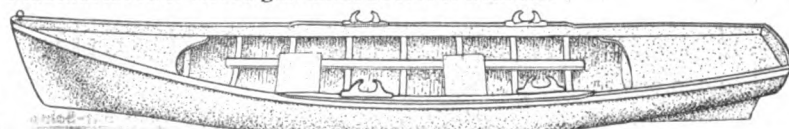
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Stand Government Inspection.

Manufactured of No. 18 galvanized steel or heavier.



Cuts show two of our many patterns. Prices quoted on application on almost any size metal boat or yacht hull.

Ripley Hardware Co. BOX F. Grafton, Ill.

Manufacturers of Metal Boats and Skiffs.

FILTRATION PLANT FOR THE CITY OF WASHINGTON.

The water supply of the city of Washington is shortly to be improved by the construction of a large filtration plant, work on which is now in progress under the supervision of Lieut. Col. A. M. Miller, corps of engineers, U. S. A., and Mr. Allen Hazen, consulting engineer. The contract for the centrifugal pumps and the engines has been awarded to the Worthington Co. of New York, who will supply three 36-in. pumps of the triple-vane impeller type, each direct connected to a Harrisburg, four-valve, tandem-compound, condensing engine. Each unit will be capable of supplying 30,000 gallons of water per minute at a total head of 35 ft. The government specifications require an exceptionally high efficiency in the pumping equipment and every part of the plant will represent the latest and best practice. The company supplying the centrifugal pumps will also furnish the wash-water pumps, which will be of the direct-acting, compound, condensing type.

BOATS FOR WORLD'S FAIR.

The Truscott Boat Manufacturing Co., St. Joseph, Mich., has been recently given the contract for supplying the water craft that will be used on the waterways at the world's fair, St. Louis, including thirty-one mahogany trimmed electric launches, which will be, it is said, the finest and most elaborate craft of their kind ever used in a similar exposition. They are built to carry thirty-five persons. The company secured this order in competition with all leading companies and is justly proud of its victory. They were able to show that they could carry the greatest number and load and unload with the least loss of time.

John F. Allen, 370-372 Gerard avenue, New York city, reports the following sales of complete Allen portable pneumatic riveting machines for the month of September: Manning, Maxwell & Moore, New York city, two machines, and one machine each to Levering & Garrigues Co., New York city, Jackson & Corbett of Chicago, Standard Railway Equipment Co. of St. Louis, American Structural Steel Co. of East Carnegie, Pa., and Thompson Iron Works, Philadelphia.

EXTRA LARGE WHITE OAK TIMBER.

As there has lately been more or less call for white oak timber of extra large size, both as to diameter and length, it will no doubt be of interest to those needing such to learn that they will no longer be obliged to scour the country in order to have their wants supplied, as has heretofore often been the case, thereby entailing extra expense, not to mention delays. In order to supply such wants without delay, the well-known house of F. S. Shurick, 18 Broadway, New York city, which has for years made a specialty of furnishing all manner of white oak timber, plank and dimension stock to ship yards, dock builders, railways, etc., has, with an eye to being prepared to furnish anything called for in this line, completed arrangements whereby large sized white oak timber running from 14 in. square and from 40 to 65 ft. in length, can be furnished customers on shortest possible notice.

The manufacturers of what is known as "No. 205 lubricating graphite" recommend it specially for marine use, and from the opportunity that they give to test its merits without expense of any kind they certainly seem confident that it will meet with favor. They offer to send free to any one interested a quarter-pound can, together with the instructive booklet "About Graphite Lubrication." These can be had by addressing the United States Graphite Co., Saginaw, Mich. The manufacturers say that this graphite is air-floated to an impalpable fine powder, contains absolutely no grit, is adhesive, and does its work of lubrication perfectly.

About as ridiculous a story as was ever published was one in a New York newspaper that Sir Thomas Lipton has sold Shamrock I. to a concern which proposed to use her in carrying scrap iron from New York to South American ports. Shamrock I. might carry cork, but she certainly will never carry iron.

After a period of idleness extending over several years the cruiser Columbia is to be fitted for sea and will join the drill squadron at an early date. Although fitted with three screws it is probable that the Columbia will cruise only with the center propeller.

Galveston, Texas, Oct. 7, 1903.

Sealed proposals, in duplicate, for grade raising at Galveston, Texas, involving over 11,000,000 cubic yards of filling, will be received by the Chairman of the Grade Raising Board, until 2 P. M., Dec. 7, 1903, and then publicly opened. For information apply to E. K. Cheesborough, Secretary Grade Raising Board, Galveston, Texas.

Dec. 3 C. S. RICHE, Consulting Engineer.

Sealed proposals will be received at the office of the Lighthouse Board, Washington, D. C., until 2 o'clock p. m., November 3, 1903, and then opened, for furnishing the materials and labor of all kinds necessary for the construction and delivery of five first-class steel steam light-vessels, Nos. 78, 79, 80, 81 and 83, for a fixed sum for each vessel. Bids will be received for: one or two vessels delivered at the General Lighthouse Depot, Tompkinsville, N. Y.; one or two vessels delivered at the Lighthouse Depot, Edgemoor, Del.; one or two vessels delivered in the harbor of Baltimore, Md.; one vessel delivered in the harbor of New Orleans, La.; one or two vessels delivered in the harbor of San Francisco, Cal.; one or two vessels delivered at the Lighthouse Depot, Astoria, Ore. Blank forms of proposal, specifications and other information may be had upon application to the office of the Lighthouse Board. C. T. Hutchins, U. S. N., Naval Secretary. Oct. 8

Tug Wanted.

Wanted a strongly built fishing tug from 45 to 60 ft. long, with a reliable gasoline engine. Reply to M. Alpern, Alpena, Mich. Oct. 8

\$5,000 Buys Steamer Inter Ocean

Length 214 ft., beam 36 ft. Capacity 1600 tons. Steep compound engine. Boiler allowed 110 lbs. steam. Address C. S. Mahoney, 17 Main St., Buffalo, N. Y. tf

Schooner for Sale.

For Sale—Schooner Howlett, 127 ft. long, 29 ft. beam; carries 200,000 ft. of lumber. Outfit nearly all new. Boat in good condition. Enquire McCracken Bros., Muskegon, Mich. Oct. 15

WHITE OAK
TIMBERS, PLANK
AND
DIMENSION STOCK
F. S. SHURICK,
18 Broadway, NEW YORK CITY

Package Freight Steamers for Sale.

For Sale.—Steamers JOHN C GAULT and RUSSELL SAGE; 1,200 tons capacity; complete fit out for package freight. Inland Lloyds rating, A2. Compound engines and two marine boilers in each boat; in fair condition. For particulars address A. W. Colton, Toledo, O. Oct. 29

Tug for Sale.

Tug Warwick—Engine 15x17. Boiler allowed 110 lbs. steam. Both in first-condition. Hull practically new. Boat inspected and ready to run. Cheap for cash. Can be seen at Toledo, O. Apply to James Rooney, 1118 Collingwood ave., Toledo, O. tf

Boiler For Sale.

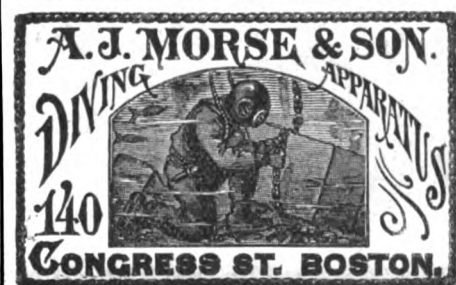
For sale cheap. Scotch marine boiler 10 ft. by 78 in triple riveted, 5/8 steel plate, dome 6 ft. by 24 in., 98 three inch tubes, stays 3/8 center; allowed 168 lbs steam pressure. Boiler is now working and is as good as new. Address I. Applebaum, Detroit, Mich. tf

Small Steam Barge for Sale.

I have for sale a small steam barge Carries 250 tons. Address, Capt F. E. Wood, Alexandria Bay, N. Y. tf

Steamer and Tow Barge for Sale.

Lake steamer and tow for sale. Total tonnage 1,000. Equipment complete A-1 condition. Address, G. M., care Marine Review Pub. Co., 39-41 Wade Bldg., Cleveland, O. Oct. 15



Two Steamers Wanted.

Cash will be paid for two steamers for Pacific trade if found suitable as to dimensions, etc. Wooden boats will not do. They must be of iron or steel. The first vessel should be of 180 to 210 ft. length, 30 to 33 ft. beam, with 11 to 13 ft. draught aft when loaded with full dead-weight cargo. Speed from 8 to 10 knots per hour. Accommodations for about twelve first-class passengers. Capacity to be of 600 to 900 tons dead-weight. Length of the second vessel should be 135 to 150 ft.; beam 24 to 30 ft.; draught aft loaded with full dead-weight cargo, 8 to 9 ft.; capacity 300 to 500 tons dead-weight cargo; speed from 8 to 10 knots per hour, with accommodations for about ten first-class passengers. Address Box 51, The Marine Review Pub. Co., Wade Building, Cleveland, O. tf

Tug for Sale.

Length 75 ft., breadth 13.9 ft., depth 7.6 ft. Enquire H. Heinecke, Sheboygan, Wis. Oct. 29

Wanted Situation as Oiler.

Position wanted as oiler on lake vessel by party who is willing to work and anxious to get engineer's papers. Has had eight years' experience as stationary engineer. At present superintendent of a large steam plant. Can produce best of recommendations. Address Box 50, Marine Review Pub. Co., Cleveland. Oct. 8

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MANUFACTURERS OF THE BEST
BABBITT and ANTI-FRICTION
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Known for any Purpose.
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Price and Quality Guaranteed and Always
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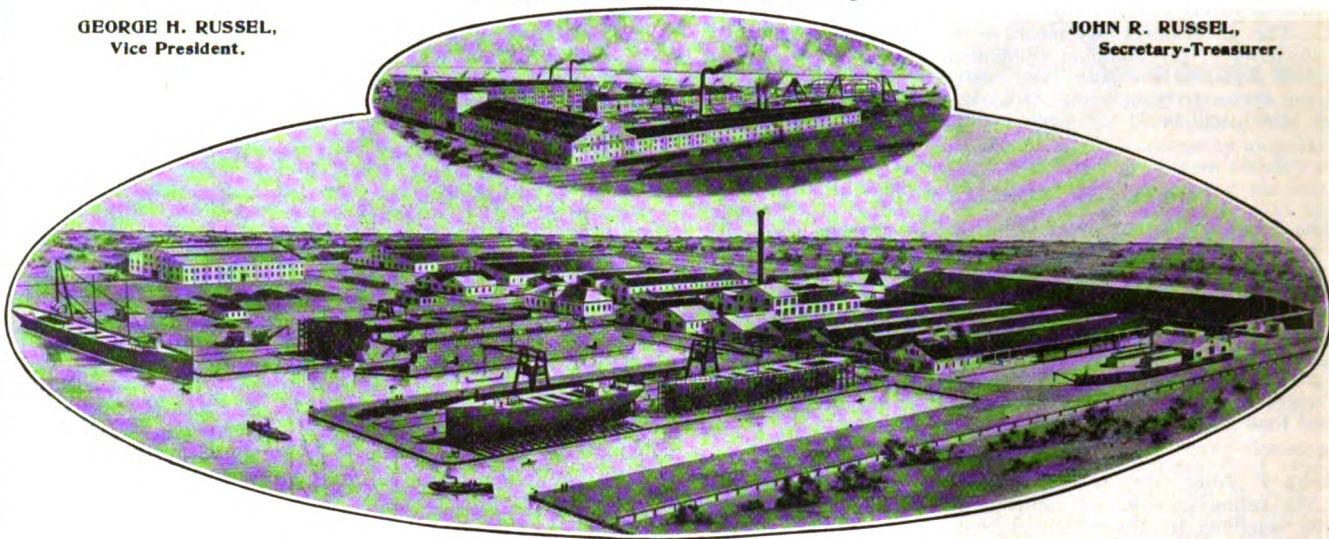
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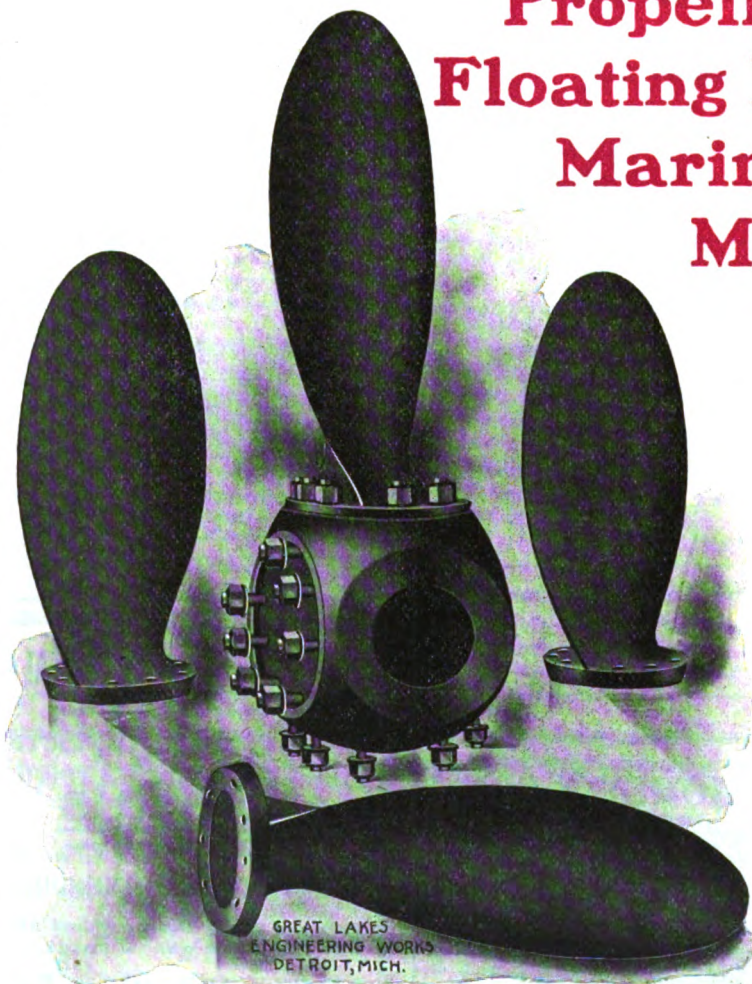
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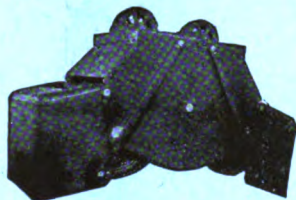
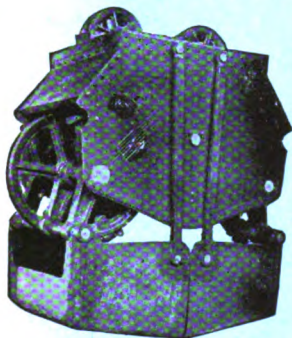
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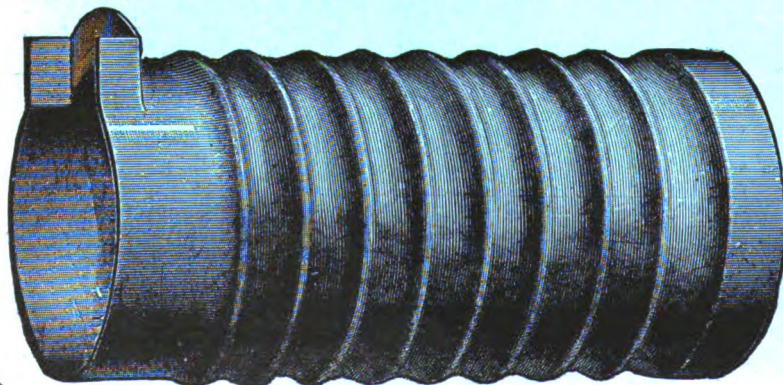
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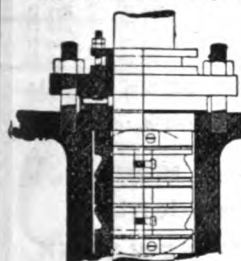
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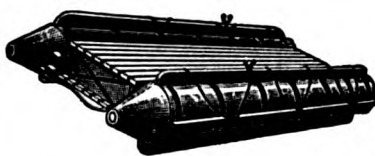
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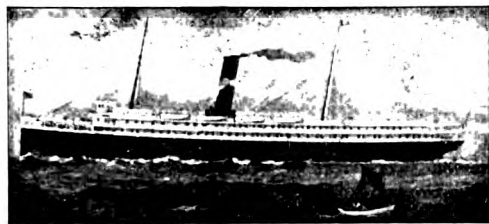
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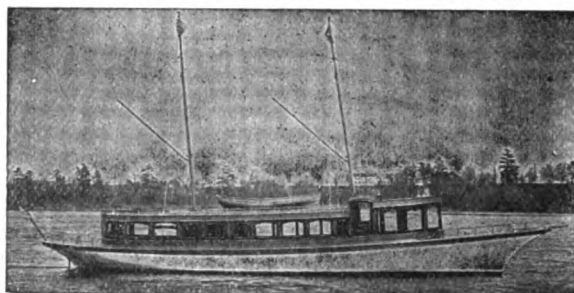
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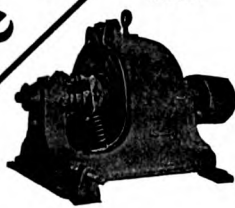
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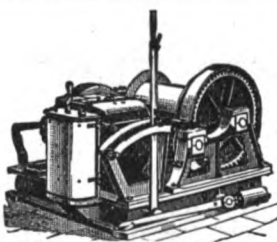
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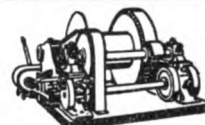
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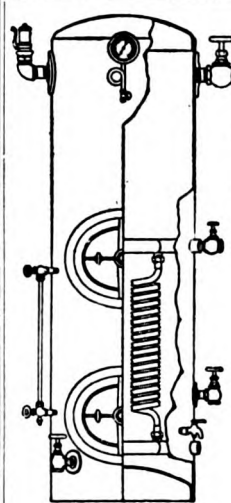
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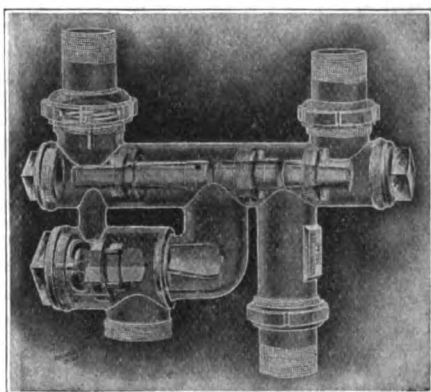


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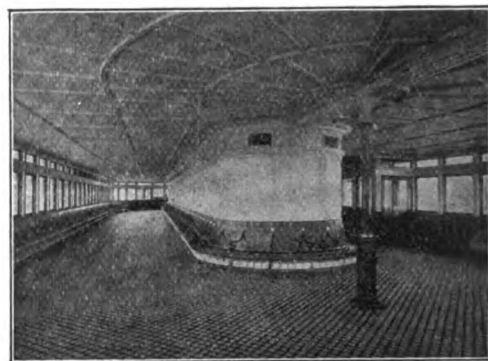
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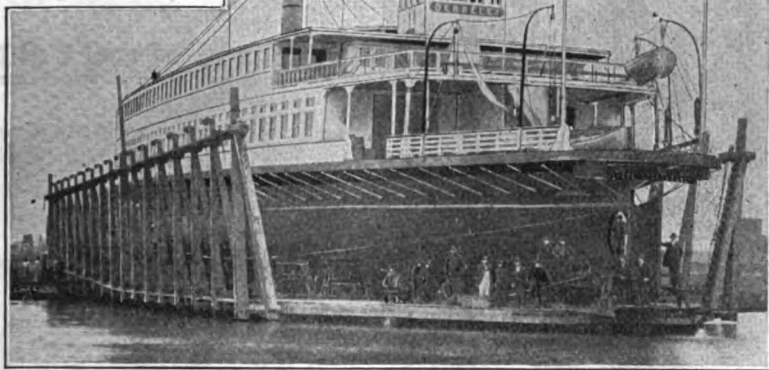
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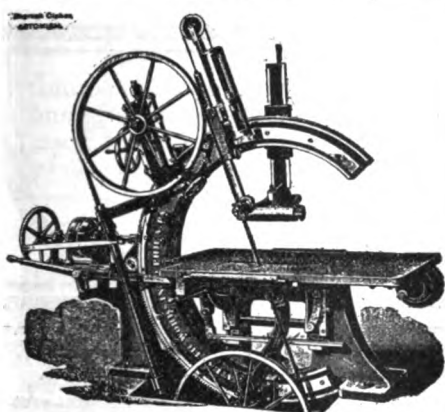
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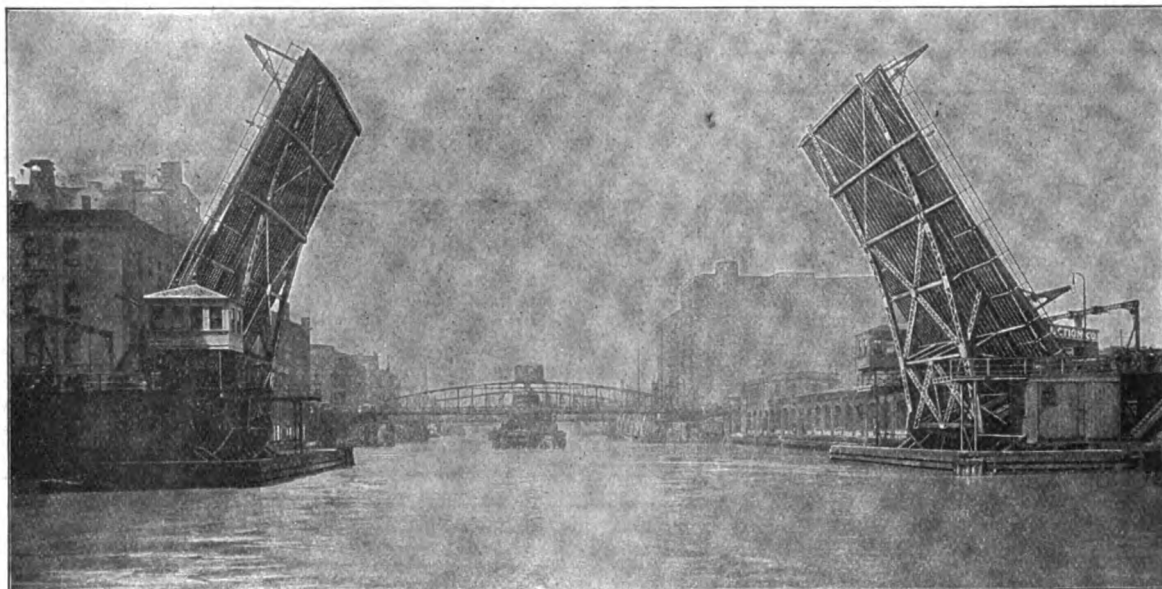
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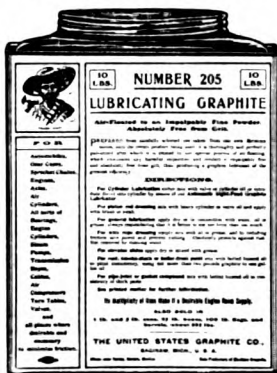
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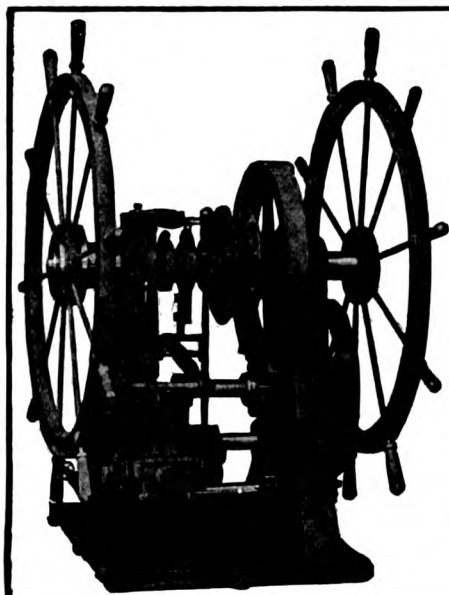
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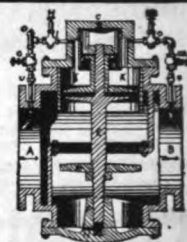
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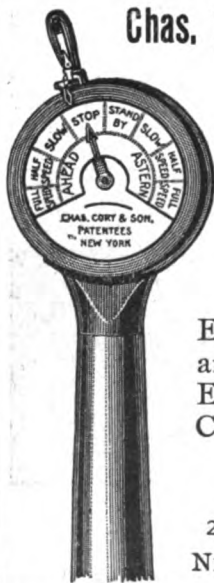
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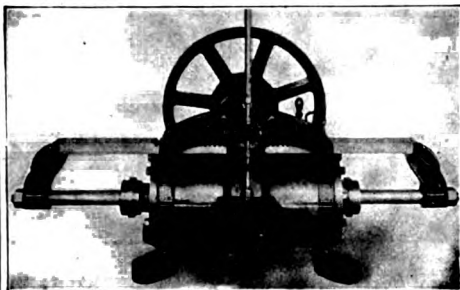
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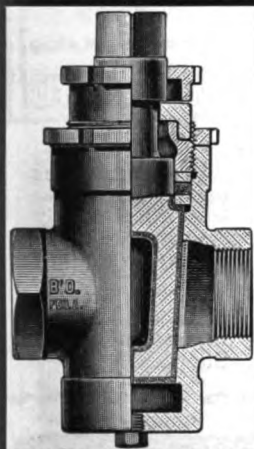
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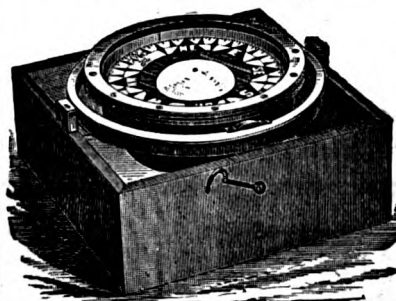
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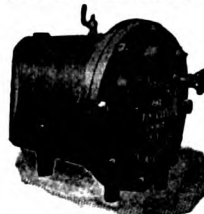
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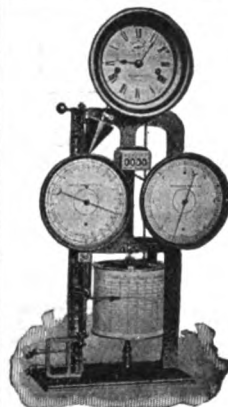
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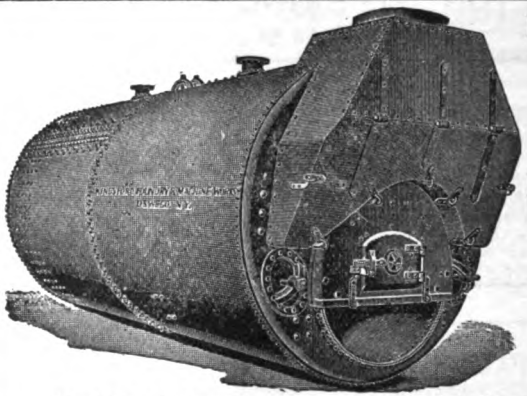
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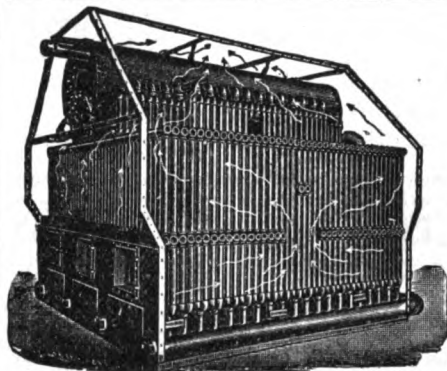
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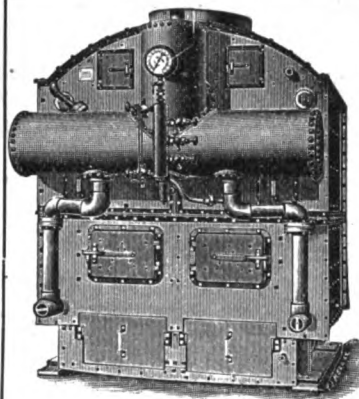
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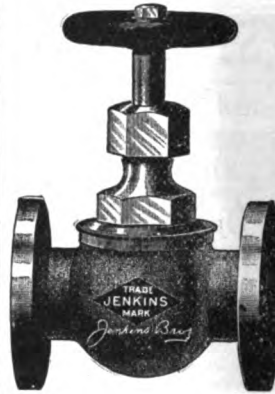
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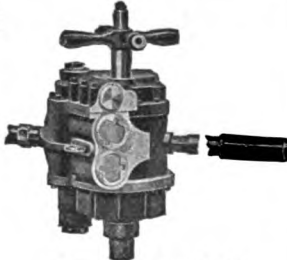
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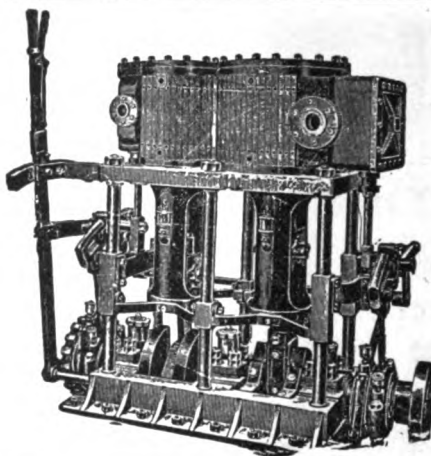
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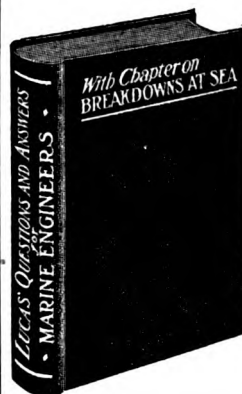
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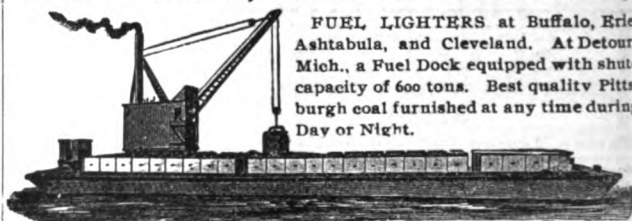
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American Ship Windlass Co.	8			*"Long-Arm" System Co. 1			
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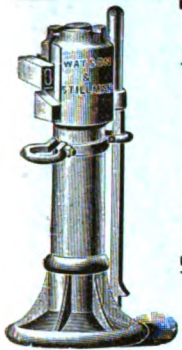
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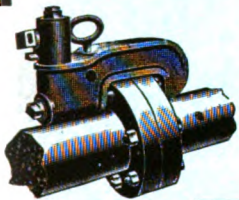
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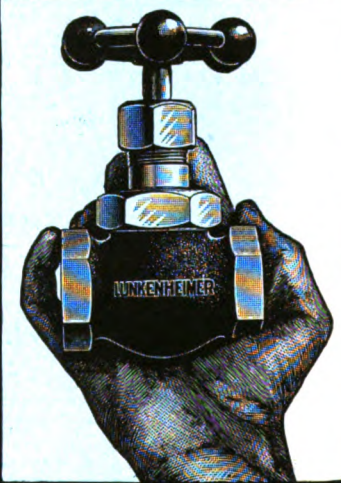
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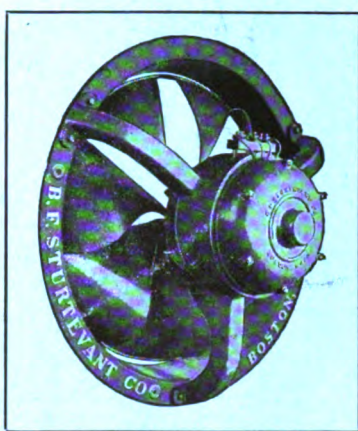
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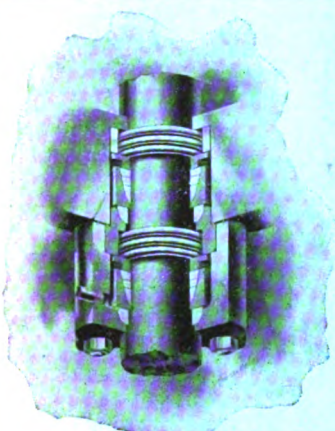


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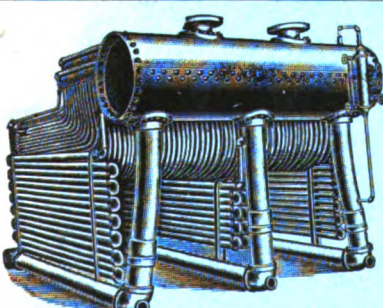
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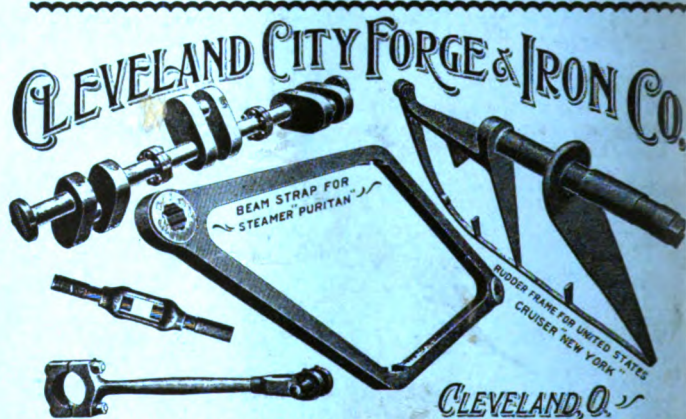
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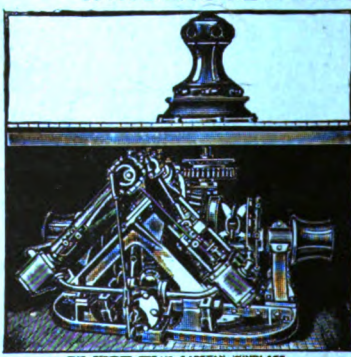
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